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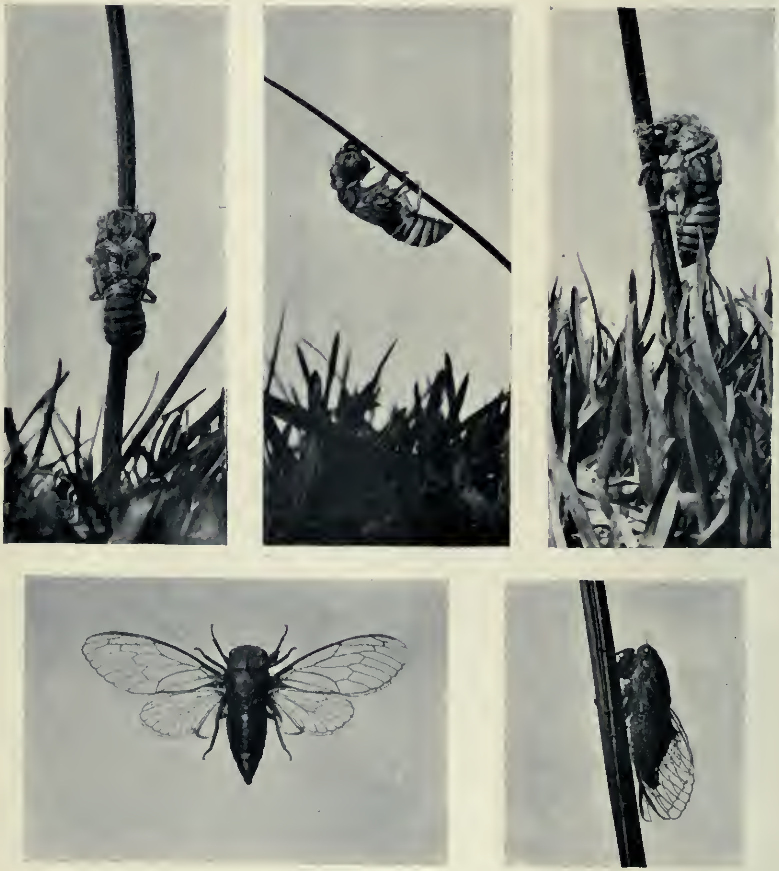

West, Newman proc.

CICADETTA MONTANA.

NYMPH-CASES AND IMAGINES.

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CICADETTA MONTANA.

By G. Lyle.

(Plate I.)

Cicada montana, Scop. = *C. hæmatodes*, Linn. = *C. orni*, Sulz. = *C. tibialis*, Latr. = *C. anglica*, Sam. Ent. Comp. et Curt. Brit. Ent.

From Homer downwards poets have sung the praises of the Cicada, though possibly cicadas and grasshoppers were not distinguished by the ancients, and the words of the poet in honour of Tettix, the singer, may refer as much to the one as to the other.

In this country, however, the Cicada appears to have been discovered at about the date of the Battle of Waterloo, and probably the first reference to the species as British occurs in Samoulle's 'Ent. Useful Compendium,' published in 1819, where we read: "The only species known to inhabit this country was lately discovered by Mr. Daniel Bydder, *near* the New Forest" (*in* the New Forest according to Kirby & Spence). Swainson (1835) mentions *C. anglica* as the only British species. Westwood (Class. vol. ii. p. 426, 1834) tells us very little more than that it is found in the New Forest; that a female was kept in captivity by Dale for two or three days; that Curtis's name is supposed to be synonymous with *C. hæmatodes*; and that Weaver found the pupa-case attached by the legs to a stem of a fern, upon the roots of which he, as well as Curtis, supposed that the larva feeds.

Abel Ingpen, "A.L.S. & M.E.S.," gives it among the special rarities to be taken in the New Forest, in his 'Instructions' of 1839. J. R. Wise, in his 'History of the New Forest' (1862), tells us that it was taken in June, 1858, by a Mr. Farren, who was attracted to it by its peculiar monotonous humming noise. On June 2nd, 1862, he captured two others, which rose from the fern, and at the same time heard two more.

Houghton says, in his 'Sketches' (1877, p. 35): "The English Cicada (*C. anglica*)"—rather well figured at pl. i. fig. 1—

"has been occasionally seen in great numbers in the New Forest," while Dallas puts it pretty clearly in his 'Elements' at p. 408. He says: "We have only a single British representative; this is *Cicada hæmatodes,* an insect of great rarity in Britain, being only found in the New Forest, and even there it seems to be of very uncommon occurrence."

According to a local guide-book, a nymph was bought from a collector in the forest by Mr. A. Piffard, of Hemel Hempstead, in 1881.

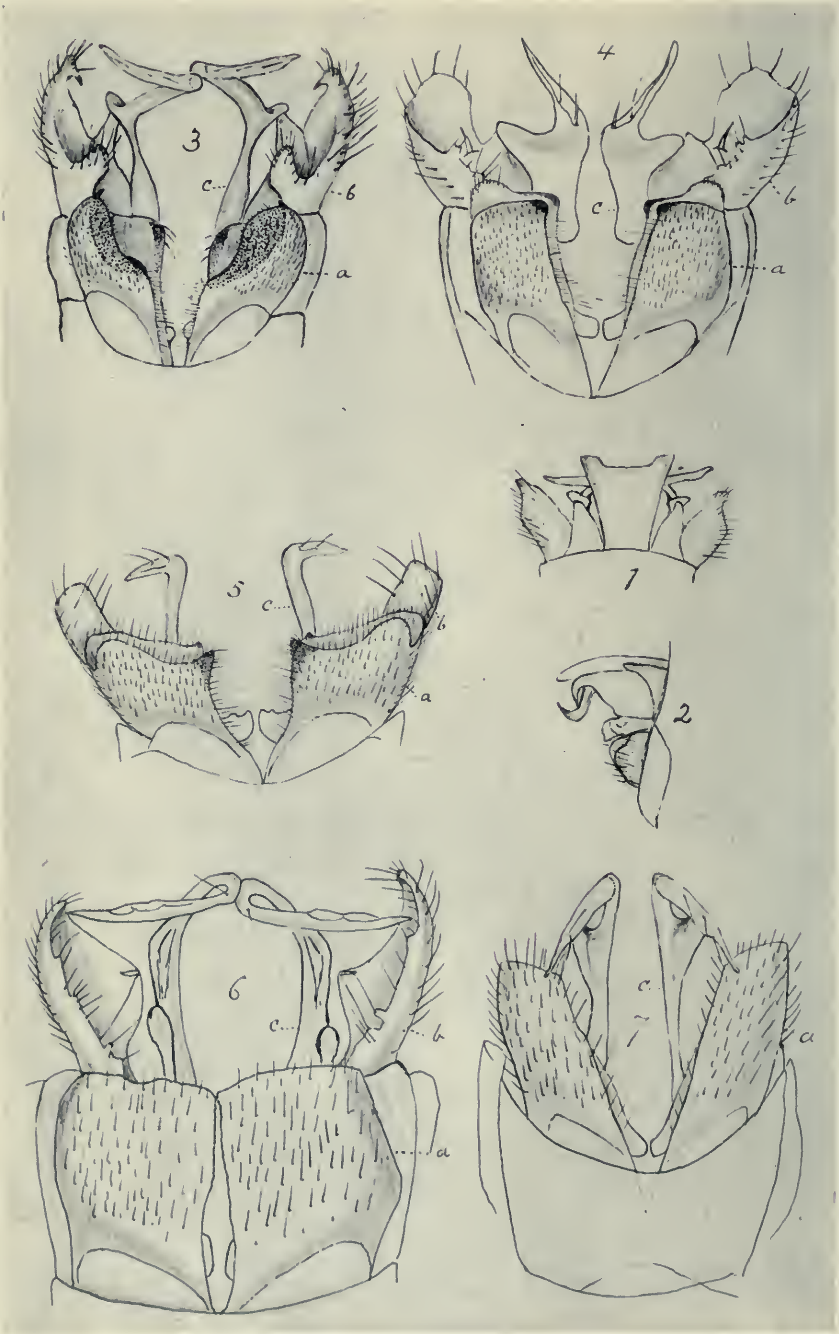
A specimen was exhibited at a meeting of the South London Entomological Society, on August 13th, 1896, said to have been one of three taken by Mr. Heasler, in Surrey, he having been attracted to it by its song; and the late Mr. C. G. Barrett records it from the same county (E. M. M. vol. i. 1864–1865); these, so far as I know, are the only records of captures outside the New Forest.

My first introduction to the Cicada occurred on June 26th, 1901, when I netted a specimen on the wing near Lady Cross, Brockenhurst, and for some years I saw nothing more of it; but in 1907 Mr. C. W. Colthrup informed me that on June 11th, 1901, he took a female apparently just emerged, and sitting on its pupa-case, chirping merrily, at about 11.30 a.m. He suggested that we should pay a visit to the locality, with a view to obtaining other specimens. This we did on June 12th, 1907, the day being wet and windy. Although no imagines were forthcoming, we soon found three of the empty nymph-cases lying loose but undamaged on the grass, showing that the insects had but recently emerged.

A dry sunny bank, with a south-westerly aspect and light soil, covered with rabbit-cropped grass, dwarf bracken, and stunted heather, and overhung by pine-trees, appears to be the metropolis of the Cicada. This spot has clearly been occupied by it for many years, Dr. D. Sharp having informed me that he took it there in the seventies. Referring to this locality, Mr. Claude Morley says (*in litt.*, August 20th, 1909): "On June 16th, 1907, I took a pair *in cop.* on bracken-stem: this pair I was able to trace by their song. They were sitting *in cop.* on the stem of a bracken, close to the ground. It would almost appear as though this copulation had taken place immediately upon emergence from the nymph, though, if such be the usual course, of what use is the song?" He also mentions that in 1907 he heard the species "singing," or, rather, "whistling," in several different parts of the forest, and that all the others appeared, without exception, to be in trees.

In 1908 I searched the spot thoroughly on June 7th, in company Mr. W. J. Lucas, but neither of us could meet with any trace of the Cicada. During the past summer, however, the Fates have been more propitious, for on June 11th four

The Entomologist, January, 1910. Plate II.



THE GENUS POLYCENTROPUS.

West, Newman proc.

empty nymph-cases were found, and six more within the next few days. Of these, six were lying on the turf, two were hanging from blades of grass, while the remaining two were firmly attached to the stalks of bracken some two or three inches above the ground, in a manner similar to that in which the nymph-cases of many dragonflies are to be found. It seems clear that the last four were in the position that the nymphs themselves assumed, the others having probably been dislodged by rabbits or other browsing animals. Although none of the imagines were found actually at this spot, four (two males and two females) were captured in the near neighbourhood.

The following particulars regarding the nymph-cases may be of interest:—

Length of male, 15·5 mm.; female, 20 mm. Length of wing-case: female, 7 mm.; male, 5·5 mm. Dorsal split along head and thorax, through which the imagines have escaped. Surface slightly pubescent, especially ventral surface of abdomen and legs. Colour pale ochre, with dark dorsal bands at the sutures. The fore legs are modified for digging, somewhat as in the mole-cricket, and in every case soil was adhering to them. The tongue appendage and wing-cases are free, as, of course, are the legs, and traces of the ovipositor may be discerned in the female.

My best thanks are due to Dr. D. Sharp and Messrs. C. W. Colthrup, W. J. Lucas, and Claude Morley, for kind help in the preparation of these notes.

A NEW SPECIES OF *POLYCENTROPUS* (TRICHOPTERA).

By Kenneth J. Morton, F.E.S.

(Plate II.)

In a small lot of Neuroptera (in the Linnean sense), collected by the Rev. A. E. Eaton in the Pyrenees in 1905, and kindly presented by him to me, there are included three specimens of a *Polycentropus* which is evidently undescribed, and which possesses appendages very different from those of any of the other known species.

McLachlan (Mon. Rev. and Syn., first additional supplement, p. 54) gave up the attempt to describe the insects of this genus from general characters, and relied entirely on the appendages as a means of separating the species. He found it practically impossible to give any intelligible description based on form, colour, and size. The present species is quite as ordinary looking as the others, while it takes a foremost place with respect to the peculiar structure of the appendages.

Polycentropus intricatus, n. sp.

Anterior wings fuscous, thickly irrorated with golden yellow spots, the dark portions of the anterior wings, especially the spots on the costal margin, being rather pronounced, as in *P. kingi*. In the male the dorsal plate, in dried specimens, is gradually dilated to the apex, which is shallowly excised for the greater part of the hind margin. At the base, on either side, is a small triangular lobe. The superior appendages are elongate, their form best seen from beneath, concave, with a basal, inwardly directed process with rounded apex; the tips inturned and hooked. Intermediate appendages slender, first divergent then approximated, and afterwards abruptly turned outwards. Inferior appendages obtuse, concave; on the inferior apical portion punctate in a prepared example. Expanse of anterior wings, 14–16 mm.

Laruns, September 3rd and 4th.

In studying this new species I had occasion to make preparations of all the European forms of which I possessed adequate material, including all the described species excepting those which are known exclusively from the Iberian peninsula. The figures given here (3 to 7) show the apex of the abdomen from the under side. The dorsal plate is not shown at all. This plate (tenth tergite) is in the genus a rather thin, membranous structure, liable to shrivel when treated with caustic potash, and also, from its transparency, sometimes difficult to define. The parts shown are the inferior appendages (genital feet of Klapálek and others), the superior appendages (*appendices præanales*), and, lastly, what McLachlan termed the intermediate appendages ("chitingräten" of Ulmer). The genital feet and the *appendices præanales* are the true genital *appendages*, and are attached to the ninth abdominal segment. The "chitingräten" are probably *processes* of the tenth segment. The term "intermediate appendages" employed by McLachlan has no definite morphological meaning, having been used by him to designate different parts in different groups or genera.

In the figure of *flavomaculatus* the *appendices præanales* are not shown. In fig. 2 alone is the penis indicated.

Explanation of Figures.

1. *Polycentropus intricatus*, n. sp. Apex of abdomen from above.
2. ,, ,, ,, ,, from side.
3. ,, ,, Apex of abdomen from beneath (more enlarged).
4. *P. kingi*, McLach. Apex of abdomen from beneath (more enlarged).
5. *P. excisus*, Klapálek. ,, ,, ,,
6. *P. multiguttatus*, Curt. ,, ,, ,,
7. *P. flavomaculatus*, Pict. ,, ,, ,,

a, inferior appendages; *b*, superior appendages; *c*, intermediate appendages.

ON THE GENUS *ZETHENIA*; WITH DESCRIPTION OF A NEW SPECIES.

By Louis B. Prout, F.E.S.

The eastern Asiatic genus *Zethenia* (family Geometridæ) was established by Motschulsky in a paper on Insects from Japan in Et. Ent. ix. p. 34 (1860), and was well re-characterized by Meyrick (as *Zettienia*—name wrongly written) in Trans. Ent. Soc. Lond. 1892, p. 102; so that I need not discuss generic characters, beyond mentioning that I find the normal base of the first subcostal of the fore wing often weak or obsolete, leaving this vein to arise apparently out of the costal, as in the genus *Gyadroma*, Swinhoe—which, indeed, might perhaps be treated as a subgenus of *Zethenia*, differing only in secondary sexual structures on the male hind wing.

The type of the genus is, of course, *Z. rufescentaria*, Motsch. =*consociaria*, Christ. I do not know on what ground Staudinger queries Motschulsky's older name; if he means that he cannot determine it at all I would suggest that it is illogical to use the generic name *Zethenia* for other species than Motschulsky's; if he merely wishes to indicate a doubt whether the Japanese form is co-specific with that of the mainland (*consociaria*), he should have catalogued the two provisionally separately, or at least omitted Japan from the given range of the latter; but I would submit that his excellent figure in vol. x. of 'Iris' sets the identity of the Amur and Japanese forms at rest.

The second species made known to science was *albonotaria*, Bremer, described as a *Selenia*, from East Siberia. Its range is similar to that of *rufescentaria*, and Bremer (ignorant of Motschulsky's work) treated the last-named as "var. c" of *albonotaria*, while Staudinger suggests that the two are perhaps "Darwinian forms." I see no necessity for this, though admittedly the alliance is very close. To me they are full "species," and Mr. A. E. Wileman, who collected for about fourteen years in Japan, and used to beat out both species in abundance, tells me that he never saw any reason to doubt their distinctness. He found *rufescentaria* the more abundant of the two. I may point out that it is, on the average, the smaller species, has the elbow in the margin of the fore wing (at end of second radial) somewhat less strongly pronounced, usually has the discal spot of hind wing larger and more conspicuous, and the postmedial line of both wings developed (whereas in *albonotaria* it is expressed by mere series of vein-dots), and *never* possesses the characteristic mark between third radial and first median, which is never absent in *albonotaria*, and which gave it its name. Christoph also mentions that the antenna in *albonotaria* is much more shortly ciliated, and that this species lacks a row of terminal dots which are present in *rufescentaria.*

A third genuine *Zethenia* (for Staudinger's other two are entirely out of place here) was described from China by Leech in 1897 as *contiguaria* (Ann. Mag. Nat. Hist. (6) xix. p. 223). In addition to its dark colour it is quite easily known from the two older species by the more gently convex (not elbowed) termen of the fore wing, and by characteristic pale marks between submedian and first median veins (veins 1–3) at the postmedial line. Warren's *Z. obscura* (Nov. Zool. vi. p. 66) from Formosa is either a synonym of *contiguaria* (so Swinhoe, Trans. Ent. Soc. Lond. 1902, p. 613), or at most a slight geographical race. Perhaps the termen of fore wing is even less convex (or less concave below the apex), and if it be separable on this ground a female from Chekiang in coll. Brit. Mus. should be associated with it. Bastelberger, in his new Catalogue of the Geometridæ of Formosa, records only one *Zethenia*—*Z. rufescentaria*—one in good condition in coll. Moltrecht ('Iris,' xxii. p. 175). No description is given, but it hardly seems likely that he took a *contiguaria* (*obscura*) for a form of *rufescentaria.*

Before describing the new species I may add that Leech, in his well-known paper, briefly mentions two aberrational forms. *Z. rufescentaria* var. [ab.] *grisearia*, Leech (Ann. Mag. Nat. Hist. (6), xix. 223), refers to the greyer forms, which often have the central area darkened; these seem more frequent in the female, the redder forms in the male, but the variation is not wholly sexual; the name can therefore stand as aberrational, *consociaria* being mainly synonymous with type (see Bull. Mosc. 1880 (2), p. 68). The other aberration mentioned (*loc. cit.*), and which Leech was mistaken in supposing to be Christoph's *consociaria*, consisted of two light specimens which are still traceable in his collection, and which must have been studied less closely than most of his material; one of the specimens (from Nagasaki) is a light *albonotaria*; the other (from Ningpo) belongs to the new species (see below).

ZETHENIA INACCEPTA (Warren MS.), mihi, nov. sp.

♂ ♀, 40 mm. Wings shaped nearly as in *Z. contiguaria*, Leech; apex of fore wing acute, distal margin straight or faintly sinuate inwards below apex, slightly gibbous behind cell; distal margin of hind wing somewhat crenulate, but less strongly than in *albonotaria.* Ground colour pale yellowish brown (slightly yellower in the male), densely irrorated with purplish fuscous, the fuscous scales absorbing nearly the entire marginal area of fore wing for a breadth of about 5 mm., in the male leaving only a few apical scales of the ground colour, in the female a conspicuous pale apical mark, and irregular pale markings elsewhere in this dark area; male in addition strongly clouded with purplish fuscous over the greater part of fore wing, and nearly the whole of hind wing (variable in individual specimens), tending to leave pale patches behind median shade of fore wing (from costa nearly to third radial, and again from first median to inner margin), and narrowly behind postmedial line of hind wing. Discal spots blackish, rather distinct. Transverse lines inconspicuous, the most noticeable being the median shade, which, on hind wing, passes *behind* discal spot (as in *contiguaria*), not across it, as is so usual in *rufescentaria* and *albonotaria* ; inner line scarcely traceable, indicated by one or two blackish dots, outer (postmedial) by rows of blackish vein-dots, these being rather distinct towards costa of (or rarely throughout) fore wing and throughout hind wing. Under side practically identical with upper.

Types (male, August 2nd, 1909 ; female, August 26th, 1909) from Chungking, Szechuan, China, in coll. L. B. Prout ; collected by Mr. Barry, presented by Dr. M. Culpin, of Shanghai. Dr. Culpin also sent another pair, precisely similar but somewhat worn, taken at the same place on August 14th, 1909. The species must be widely distributed, at least along the Yang-tse-kiang, but it is somewhat interesting that the only known localities, though separated by nearly nine hundred miles, agree almost precisely in latitude. Besides the four specimens in my collection, from which the description has been made, I know three only, all in the British Museum. Two males, labelled Chekiang, collected by Pryer, and bearing the MS. name of *inaccepta*, Warr., which I have adopted, are clearly co-specific, though somewhat more variegated than the type-form, and one somewhat redder in tone ; they did not come through the Leech collection, but were, on the presentation of that collection, merged in the series of *contiguaria*, from which they differ in the pale apex, absence of white mark at postmedial line, weakly marked under surface, &c. One almost typical female, from Ningpo (Leech coll.), has been mentioned above, as Leech had it mixed with a similarly coloured aberration of *albonotaria* as possibly representing Christoph's *consociaria*.

ON A NEW SPECIES OF PARASITIC BEE (*NOMADA*) FROM BORNEO.

By P. Cameron.

Nomada testaceobalteata, sp. n.

Head, antennæ, and abdomen black ; the apex of the first abdominal segment, the basal two-thirds of the second, the apex of the last and the greater part of the ventral segments, dark testaceous, the thorax rufous ; the legs black, the femora broadly testaceous. Wings hyaline, the nervures and stigma black, the apex with a narrow but distinct blackish cloud. Face, clypeus, apical half of metanotum and pleuræ densely covered with silvery white pubescence. ♂. Length, 4 mm.

Kuching (Mr. John Hewitt, B.A.).

The mandibles are of a paler rufo-testaceous colour than the face. Front and vertex closely strongly punctured. Temples straight, sharply obliquely narrowed. Occiput transverse, margined, as is also the base of the pronotum. Mesonotum and scutellum closely distinctly punctured, the sides of the former depressed. Apex of scutellum obliquely sloped. Metanotal area large, reaching almost to the apex, its base finely closely punctured, the apex smooth and shining; the sides and apex of metanotum are finely distinctly aciculated. First abscissa of radius longer than the following two united, the second about one-fourth longer than the third. There is a distinct keel between the antennæ, projecting clearly above and below them. Apex of clypeus bluntly broadly rounded. Flagellum of antennæ dark brownish below. Abdomen smooth, the basal segments more smooth and shining than the others.

Allied to *N. adusta*, Sm.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from vol. xlii. p. 152.)

Before speaking of the unnamed forms of aberration in this group it will be well to mention one named variety of *M. deione* which had hitherto escaped my notice, *viz.* var. *nevadensis*, Obth., 'Etudes de la Lepidoptérologie comparée,' i. p. 15 (1904), of which he writes as follows:—* "Elle se distingue par une tinte plus pâle en dessus comme en dessous; par les lignes transversales médianes des quatre ailes plus anguleuses; par l'absence, sur les ailes inférieures en dessous, près de la base, de la coloration fauve qui, dans tous les autres exemplaires, remplit, du bord costal au bord anal des ailes, un espace compris entre deux lignes noires et au centre duquel reste une tache chamois clair, c'est-à-dire de la couleur du fond des ailes." In other words, the inner dark band un. s. h. w. is wanting, and the central and basal bands and the light spots coalesce, except for the usual bordering black lines. These specimens were of the second brood, and were taken at a considerable height in the Sierra Nevada.

This is not a very unusual form of aberration in several species, especially when less completely carried out; I have seen it more or less completely in *athalia*, *parthenie* (especially Italian specimens), and *asteria*, and the same tendency shows itself occasionally even in *dictynna* and *britomartis*. I do not, however, remember to have seen it either in *aurelia* or *varia*, and certainly have not done so in the case either of *berisalensis* or of *dictynnoides*. An opposite form of aberration in which this inner band is enlarged at the expense of the basal band and the light spot, and sometimes of the central band also, is occasionally to be seen in all the species, but is more usual in *aurelia*, *varia*, and the others in which the lighter aberration is least common. A great difference in facies is produced by the great difference which exists in the breadth of the central band, and in the comparative breadth of the two parts into which it is normally divided, though the latter observation does not, of course, refer to *deione* and *asteria*, in which the two divisions are of the same shade. A not uncommon form of aberration, especially in *athalia*, is the absence of the division in this band; in cases where the band itself is also unusually broad the effect is almost startling; there is a magnificent example of this in the National Collection. The other bands of the un. s. h. w. are also liable to great differences in breadth and intensity of colour, especially perhaps in the size of the lunular portion of the terminal band. I have already mentioned the tendency of the light spot to coalesce with the third spot of the basal band. I have seen this occur in every species, and possess examples of it in all except *asteria*. The principal, if not the only, forms of aberration on the f. w. un. s. consist in the intensification or obsolescence of the black markings, and of the number of, and the greater or less prominence given to, the light submarginal lunules.

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* It is distinguished by a paler tint above and below, by the more angular transverse median lines on all four wings, by the absence on the hind wings, under side, near the base, of the fulvous colouring, which in all other specimens fills, from the costa to the inner margin, a space enclosed between two black lines, and in the centre of which is a spot of clear yellow, *i.e.* of the ground colour of the wings.

On the upper side the greater or less breadth of the black markings, their obsolescence or exaggeration into melanism, their sharpness or suffusion, and to a less extent their angulation, form one great cause of aberration, the other is the intensity and the variegation of the ground colour. All these forms of aberration are, to some extent at least, common to all the species, but I think it may be safely asserted that variegation in the ground colour is confined *in this group* to the female. A very wide and difficult question is opened up by the approaches made, individually or racially, by one species towards another, but this will perhaps be best dealt with in considering the range of variation in each species.

As *athalia* is at present the dominant species in Europe, and is also that to which all the other species except those of the high mountains, viz. *asteria* and *varia*, are usually considered to approach most nearly, it will be well to take it first. With very few exceptions it seems hopeless to give characteristics for local races of this species for three reasons: first, because in many localities such different forms are found together; secondly, because in other places neighbouring valleys produce such distinctive forms that one would require a detailed knowledge of all localities to cope with them; and thirdly, because no sooner does one seem to have discovered a rule than it is upset by the next piece of knowledge acquired on the subject. As an example of the first difficulty I may refer to the specimens bred by Mr. South from North Devon larvæ, which were exhibited at the South London Society, and of which an account may be seen in the 'Proceedings' of that Society for 1885, p. 33; with them were exhibited specimens of Swiss *aurelia*, *parthenie*, and *dictynna* to show how these English specimens approached in different instances one or other of these forms. These specimens having been long dispersed I have been unable to see them, but the facts adduced, together with Kane's comments on them (Entom. xix. p. 145, 1886), are a striking example of the difficulty referred to. With regard to the differences between neighbouring localities I may mention the forms found in the valley of the Avençon behind Bex, and in the little valley behind Lavey-les-Bains, the very next opening from the Rhone Valley, and on the same side of it; the specimens from the first locality being large and bright, and the black markings of fairly even breadth, those from the other being small, of a rather pale ground colour, and the black markings having a tendency to form broadish central and narrow outer lines. This may be accounted for by the fact that the valley of the Avençon is moist and the other dry, so that the food-plant in the former is juicier and more nutritive than in the latter. With regard to the third difficulty, I may adduce the observation of Rühl and other Swiss authors to the effect that in Tessin and Lombardy (and generally south of the Alps) the tendency is to decrease in size. Now this was thoroughly borne out by my own experience, my specimens from Cadenabbia and Reazzino entirely conforming with the rule, but in the National Collection are a pair from Vallombrosa quite as large as the average of the Rhone Valley, and not differing in colour or markings from many of the brighter specimens from that part of Switzerland; and, worse still, Mr. Lowe has this year brought home, *from Reazzino*, large and brilliantly coloured examples, which upset not only my rule, but my actual previous personal experience! Again, however, it is possible that these facts may be accounted for. The localities both at Cadenabbia and Reazzino where I took my specimens were very dry; now much of the neighbourhood of the latter place is very moist, not to say marshy, and, as Mr. Lowe also brought back specimens of *britomartis*, which is confined to the marshy parts, it is very likely that his *athalia* came from the same spot; and, whilst Cadenabbia is dry, Vallombrosa is not. Furthermore, it is a curious fact, for which I am not yet able to account, that the forms of Central Italy are far less southern (paradoxical as it sounds) than those of the lake district of the north—*Pararge mæra*, e. g. does not approach var. *adrasta*, nor *Argynnis adippe* var. *cleodoxa*, or even *intermedia*.

It will then be readily seen that such approaches to race characters as can be given are merely indicative of a general tendency, and cannot be applied to every individual case. Scandinavian specimens do not seem to differ greatly from average English ones, but are rather lightly marked, and have a slightly paler ground colour; these tendencies are rather more strongly marked in specimens from the neighbourhood of St. Petersburg, which are moreover rather larger. English specimens are, as a rule, smaller than the plain form of Germany and Switzerland, but rather larger than those found in the mountains; the latter are also in general somewhat more heavily marked. In the lower Misox Valley, *e. g.* at Cama, a rather unusually bright form is found with a divided marginal blotch, and I have already alluded to the form at Faido, in the Leventina, where the elbowed line is so thickened as to bring to mind the var. *mehadiensis* of South-eastern Hungary; the Leventina form is, however, rather small. The Hungarian form just mentioned is, on the other hand, large as well as brilliant in ground colour, and heavily marked. This form is exaggerated in Bulgaria, and except as to size in Bosnia; the borders being sometimes so broad as scarcely to show the fulvous lunules, thus approaching *deione* var. *berisalensis*; this form is very fine and striking. The form from Bukowina, on the contrary, is small, heavily marked and dull, and, notwithstanding the shape of the wings, I should have taken it for a form of *dictynnoides* had it not been for the biological distinctions given by Hormuzaki (vol. xlii. p. 6). I have seen nothing from Spain which bears out Staudinger's description of var. *iberica*; four of the six specimens so labelled at the present moment in the National Collection are certainly *parthenie*, of a rather usual form, and the other two, though not heavily marked, are not paler in ground colour nor larger than usual. The females from the Pyrenees have a lighter ground colour, but are smaller than the average, as are the males, and both sexes are also rather heavily shaded with black.

ON TWO OF FRED. SMITH'S SPECIES OF JAPANESE ICHNEUMONIDÆ.

By Claude Morley, F.Z.S., F.E.S.

Through the generosity of Mr. A. E. Wileman, the British Museum has just acquired the second known specimen of *Pimpla luctuosa*, Smith (Trans. Ent. Soc. 1874, p. 394). I have examined the type, brought forward by Smith in his "Descriptions of New

Species of Tenthredinidæ, Ichneumonidæ, Chrysididæ, Formicidæ, &c., of Japan" (*loc. cit.*), which is in the General Collection. Smith gives but a very short description, which is, however, rendered sufficient by his remark that "this species very closely resembles the *Pimpla æthiops* of Europe"; this is perfectly true and a comparison of the new specimen with the type and the latter species in the British Collection proves its identity with the former. The female in question was bred on June 27th, 1901, from a larva of *Attacus* (*Philosamia*) *walkeri*, Feld., at Kobe, in Central Japan.

Mr. Wileman has also presented two males of *Protichneumon laminatorius*, Fab., bred by him at Kobe, in Central Japan, from the cosmopolitan Sphingid, *Macroglossa stellatarum*, Linn. Its occurrence in Asia is remarkable, though it has been known to occur at Yokohama, whence Kriechbaumer records three females (Sitzb. Nat. Ges. Leipzig, 1895, p. 127). These Japanese males, both of which have very faint traces of a flagellar band, differ from the European form only in their darker wings (as noticed, *loc. cit.*), with incrassate nervures, the basal nervure slightly more continuous through the median and the flavidous angles of the postpetiole. *P. laminatorius* has nowhere before been bred from this host, though the closely allied *P. fuscipennis*, Wesm., is known to prey upon it (*cf.* my 'British Ichneumons,' i. 19).

Fred. Smith says in his above-quoted paper that "it would be difficult to point out a specific difference" between *Ichneumon laminatorius* and his *I. cognatorius*, and does not attempt to do so, relying solely upon the different habitat to distinguish them. He gives three male and one female varieties, besides the type form, all of which are preserved in the General Collection. Their synonymy needs rectifying thus:—

I. COGNATORIUS, Smith, Trans. Ent. Soc. 1874, p. 387, male and female.—The single type is a large male with infumate wings, exactly resembling Wileman's specimens, except that the apical angles of the second segment are also narrowly pale. Taken by Lewis at Hiogo.

VAR. i.—A single large male, differing from the type only in having the wings less infumate, the face black with its orbits alone narrowly pale, and the flagellum broadly pale-banded. Captured with the type.

VAR. ii.—Three large females, undoubtedly those of the type form, and agreeing well with Kriechbaumer's description. One labelled "Hiogo. Var. 2; male," and all collected by Mr. R. Fortune in Japan."

VAR. iii.—This is an entirely distinct species from the above, belonging to the genus *Stenichneumon*, with its metanotal areola distinctly longer than broad but not rectangular.

ICHNEUMON FLAVITARSIS, Smith, Trans. Ent. Soc. 1874, p. 389.—This must be added to the above varieties, since it is a small male, much resembling the British form, with hyaline wings, the nervures not incrassate and the basal normal, and the postpetiolar angles not pale; the tarsi are white, not flavous, marked. Taken at Hiogo by Lewis.

Thus, PROTICHNEUMON LAMINATORIUS, Fab. = *Ichneumon cognatorius*, Smith, excl. var. iii.
PROTICHNEUMON LAMINATORIUS, Fab. = *Ichneumon flavitarsis*, Smith.
STENICHNEUMON COGNATORIUS, Smith = *Ichneumon cognatorius*, Sm., var. iii. only.

British Museum (Nat. Hist.): Dec. 10th, 1909.

NOTES ON ODONATA OBSERVED IN GREAT BRITAIN DURING THE SUMMER OF 1908.

BY E. R. SPEYER, F.E.S.

THE summer of 1908 will always remain pre-eminent in my notes and observations on British Odonata, for not only have twenty-four species been obtained, but two of great interest and rarity have been taken, and five others, hitherto unrecorded by me, have been met with in comparatively large numbers. The discovery of a wonderful locality in Sussex accounted for no fewer than sixteen species in two days at the beginning of August, including one which has up till this year been found in Scotland only—as far as the British Isles are concerned.

The following is a list of the Odonata recorded, with notes on their duration of flight and any peculiarities in their bionomics which chanced to come under my observation:—

Sympetrum striolatum, Charp.—First taken on July 28th in a very immature condition at the Aldenham Reservoir, in Hertfordshire. At the beginning of August it was common round Tunbridge Wells, and on August 16th round Shenley. At the end of August it was exceptionally plentiful near Tunbridge Wells, and I then took specimens no larger than *S. sanguineum*. One male was taken in a gravel-pit near Shenley on September 15th, and this specimen was worn.

S. fonscolombii, Selys.—On June 24th I had the pleasure of capturing two males of this beautiful species in a rather worn condition near Shenley, Herts. I did not observe it again until July 27th, when I netted a female at the Aldenham Reservoir.

There seems little doubt that my specimens are migratory, and possibly belonged to a swarm which visited Switzerland this year. There have most probably been two movements, the second of which would account for the female I took in July.

So far as I know, this insect has not occurred in England since 1903, when Mr. Boyd took a single female in Cornwall ('Ent. Month. Mag.,' vol. 39, p. 201).

On July 29th I thought I saw another male at Aldenham, but I could not capture the insect.

Libellula depressa, Linn., was very common this year. A mature male was caught at Burnham Beeches on June 23rd while at rest on a tyre of my bicycle which was lying on the bank of one of the ponds there. On June 24th it was exceedingly abundant at Shenley, Herts. I distinctly saw a male and female in Ogwen Lake Valley, Carnarvonshire (North Wales) on June 25th. On July 12th I took a female near Shenley which showed obvious signs of blue powder on the abdomen. The last specimen taken was a blue female on August 4th near Tunbridge Wells, in Sussex.

L. quadrimaculata, Linn., has also been very abundant, and there are possibilities of a migration having taken place. It was observed in great numbers in June at the Capel Curig lakes, in North Wales, and many immature specimens were caught. Near Tunbridge Wells it was very common at the beginning of August. Having heard of a migration of dragonflies round Alderney, I at once communicated with my friend Sir William Parker, in the Isle of Wight, and he took a specimen of this species (the only dragonfly he saw), which has very little wing coloration, but it is not justifiable to assume that it was one of the swarm from Alderney.

The wing-suffusion in many specimens from North Wales was greatly marked, whereas many from Sussex had very little colouring on the wings, showing that there is no foundation in the theory that in more northerly regions the wing-suffusion is diminished, and in more southerly extended.

When on the wing I have repeatedly noticed that this dragonfly appears of a bright blue colour, and resembles the mature male of *L. depressa* very closely. This is probably due to the reflection of light from the abdomen of *L. quadrimaculata*, and is doubtless a case of two insects obtaining a similar colour-effect by different means; but the question as to whether the colour of both species is protective, or whether there is mimicry between the two insects, presents a problem difficult of solution, especially when regarding two animals so well equipped against the dangers which arise in their struggle for existence.

Orthetrum cærulescens, Fabr., was very common on August 4th and 5th in a marsh near Tunbridge Wells. The insect did not fly very fast, and was not difficult to net. I took several specimens with very dark wings, and there was a very wide range in the size of the male.

O. cancellatum, Linn.—Two specimens of this uncommon insect were obtained at the Aldenham Reservoir (Herts), a much worn female on July 27th, and a fine male on July 29th. In addition to these, I believe I saw a male at Shenley on July 24th, but it may have been *Libellula depressa* male.

Somatochlora metallica, Van der Lind.—The fact that this insect had been found in what is practically a single locality in Scotland and nowhere else in the British Islands was a mystery in the geographical distribution of animals, and my discovery of it this year in a very restricted locality in Sussex has not gone very far to solve this mystery at present. However, I took this magnificent dragonfly in the above-mentioned county on August 3rd and 4th, and I observed it there in considerable numbers, though I did not come across the female. I first noticed the males flying round the trees and bushes which overhang the margins of certain large ponds near Tunbridge Wells, but afterwards I also saw them flying about high up in the woods and along the hedgerows in the close neighbourhood of these ponds. Settling very seldom and being peculiarly adept at avoiding the net, they were very difficult to capture, especially as the collecting-ground was treacherous. Along the hedgerows they flew with remarkable rapidity. Their food consisted of small flies, as far as I could make out. Another visit to the locality at the end of August was not wholly unsuccessful, for in addition to seeing a female which I was unable to capture, and which was ovipositing among some reeds, I saw other specimens. It seems highly probable to me, from my observations on this and the next species, that the green colour of the Corduliine Odonata is protective. It remains to be seen whether the insect has migrated from the Continent, but there is no reason for supposing this to be the case.

Cordulia ænea, Linn.—Two males were taken on June 23rd at Burnham Beeches, Bucks, where many others were seen flying at the tops of trees as well as over the water.

Cordulegaster annulatus, Latr., was fairly common in Carnarvonshire at the end of June, and I took several males near Tunbridge Wells on August 3rd and 4th. A female seen in Wales was ovipositing at about six o'clock in the evening in a stream of water by the side of the road, in which there was certainly not more than five millimetres depth of water.

Anax imperator, Leach.—On June 23rd several specimens were seen at Burnham Beeches, Bucks, and on June 24th a male and two females were captured in a gravel-pit near Shenley, Herts. The male mentioned was caught with a mature male *L. depressa* in its jaws (or perhaps it would be more accurate to say "in its legs," as the legs are used for catching the prey), showing how voracious this interesting insect is. Another observation, made in Sussex on August 4th, when several specimens were flying over a pond near Tunbridge Wells, seems to point to their love of killing apparently for their own amusement. Large numbers of white butterflies (*Pieris brassicæ* and *P. rapæ*) were flying across the water; these the *Anax* attacked, and having caught them, either divested them of a wing or two, or maimed them in a way I was unable to make out exactly, and then let them fall into the water without eating them; the detached wings were also let fall. I am not convinced, however, that this was a mere act of cruelty; it seems to me that there must be some reason for this habit, and there are two possible solutions—(1) that the maimed insects are dropped into the water for the female to eat while she is ovipositing, and more probably (2) that they are dropped there for the young nymphs to feed on. Unfortunately I observed no females in Sussex, and I was unable to collect any of the maimed butterflies, owing to their having been dropped a long way from the water's edge.

The two females taken in Hertfordshire were ovipositing by dipping the abdomen deep into the water while at rest on weed. The green colour of the female renders her almost invisible while ovipositing, and is without doubt protective.

Brachytron pratense, Müll., was plentiful at the Marston Ferry, near Oxford, in May and early in June. The female oviposits by dipping the tip of the abdomen at random into the water while flying along.

Æschna cyanea, Müll.—Common in Sussex and Hertfordshire during August and September, but much less common than usual in the latter locality.

Æ. grandis, Linn., was out in considerable numbers at Shenley, Herts, in an immature condition on July 22nd. It was common in that locality and in Sussex during August. It was still abundant at Shenley on September 17th.

In addition to these Anisopteridæ, *Sympetrum sanguineum*, Müll., was almost certainly seen near Tunbridge Wells on August 4th. Mr. K. J. Morton visited Carnarvonshire a short time after I left in June, and very kindly sent me specimens of *O. cærulescens* and *Æ. juncea*, from Capel Curig.

Eleven species of Zygopterids came under my notice:—

Calopteryx virgo, Linn.—This very beautiful insect was found plentifully flying about bushes and in the meadows round several lakes in the neighbourhood of Capel Curig, Carnarvonshire. I found one specimen dead in a spider's web, but I am doubtful if it lost its life through the agency of the tenant of the web, who was absent when I found the dragonfly. I observed the insect at the end of June.

C. splendens, Harris, was, as usual, abundant on the Thames at Oxford in May and June.

Lestes sponsa, Hans.—Near Tunbridge Wells this dragonfly was found in swarms during August. When flying over the water in the presence of *Somatochlora metallica*, it made darts at the thorax of the latter insect as it flew along, dazzled, perhaps, by the reflection of the sun's rays from the metallic surface of that insect.

Platycnemis pennipes, Pall.—Very abundant at Oxford in June. First observed on June 7th (male var. *lactea*), it was still plentiful on June 19th.

Erythromma naias, Hans.—This dragonfly was exceptionally plentiful. It was taken in large numbers at Burnham Beeches, Bucks, on June 23rd; it was abundant at Shenley on June 24th, scarce during July in that locality, but exceedingly abundant at the Aldenham Reservoir on July 29th.

The last specimen was taken near Tunbridge Wells on August 29th, a very late date for this insect; it was of the male sex.

Pyrrhosoma nymphula, Sulz.—A single male at Oxford on June 19th. Very plentiful in North Wales at the end of June, and also at Burnham Beeches, Bucks. A few were taken near Tunbridge Wells on August 3rd and 4th. The variety "*melanonotum*, Selys," was found in Wales. Many specimens were found in spiders' webs at a lake in Carnarvonshire in June.

P. tenellum, Linn.—This small dragonfly was found so plentifully near Tunbridge Wells in August as to rise up out of the grass in swarms. The variety "*æneatum*" was observed. The insect behaved towards *S. metallica* like *L. sponsa*.

Ischnura elegans, Van der L., was found uncommonly in Oxford during June, and round Tunbridge Wells in August. It was plentiful at Shenley from June to the end of August, the female var. *rufescens* being taken abundantly, and the var. *infuscans* once on July 25th.

Agrion pulchellum, Van der L.—Extremely abundant at Oxford in May and June, and showing a great tendency in markings in many cases towards the next species.

A. puella, Linn.—A few taken at Oxford in June. It was found in swarms at Burnham Beeches on June 24th, and was generally plentiful at Shenley through July. A few were taken on August 3rd in Sussex. I was greatly surprised to find no trace of the insect in Carnarvonshire, though I diligently searched for it; there is a record of it from Tan-y-Bwlch in Mr. Lucas's 'British Dragonflies' (1899, p. 289); I was unable to find it in that locality.

Enallagma cyathigerum, Charp.—This was the most plentiful dragonfly observed. In June, July, August, and the beginning of September it was very common in Hertfordshire, in June at many lakes in Carnarvonshire, and in Sussex it was swarming round the ponds near Tunbridge Wells during August. All the varieties of the male were taken, the one with the spot on segment two of the abdomen resembling that of *Agrion mercuriale* being exceedingly rare, while the opposite variety with the spot reduced was exceptionally common. The blue variety of the female was observed plentifully, while a blue form with segments 3 and 4 of the abdomen of a normal straw colour was not uncommon in Hertfordshire during July. It is worthy of note that a blue female was taken at Capel Curig, Carnarvonshire, on June 28th, and this specimen was distinctly immature, showing that the blue coloration is not always due to age.

As described for *Lestes sponsa* and *Pyrrhosoma tenellum*, this insect also was attracted by *Somatochlora metallica*, but in no case did the larger insect make an attack on the smaller ones, but showed considerable restlessness.

It is to be hoped that next year observations will be made to carry out several of the few problems mentioned in the course of my paper. Not the least important will be a second record of *S. metallica* from Sussex. It is to be hoped that the latter will not fail, although one would necessarily expect a reaction after this year's good fortune.

A FEW NOTES ON THE DIURNI AT LA BOURBOULE (PUY DE DOME) DURING JUNE, 1909.

By R. M. Prideaux, F.E.S.

The butterflies observed in this locality were very scanty, both as to species and specimens; this disappointing condition of things being, no doubt, largely due to the deplorably wet and cold weather that prevailed here (as elsewhere) during the month, and which, to all appearance, in this district had been preceded by nearly as unfavourable conditions earlier in the season.

The writer's time and energies also were considerably restricted by the medical treatment for the benefit of which the place was primarily visited, though it must be admitted that rambles further afield from the small town of hotels, of which la Bourboule consists, on to the hills, bare and wooded, which enclose it were, even when attempted, by no means encouraging.

On the whole, the lush, damp hay-fields bordering or near the river Dordogne, which runs from Mont Doré (where it rises) through la Bourboule, were found to be most prolific in butterfly life, though, compared with a Swiss valley at a similar elevation—about 3800 ft.—these meadows were barren indeed.

The bare, rather closely cropped, steep mountain pastures, on which species of broom were in fine flower during the month, produced few specimens, even of the commonest species.

The following is a list of the species observed:—

Carcharodus alceæ, Esp.—One rather worn and diminutive specimen, June 7th, in "la Fenestre," a small park close to the town, containing some meadows only partially reclaimed and planted, and which afforded a very fair proportion of the species seen in the district.

Hesperia serratulæ, Rmbr.—The commonest "skipper" in the neighbourhood, being seen in most of the meadows, the specimens being rather larger than those obtained near Bérisal. Guillemot, writing in the "fifties" on the Auvergne Lepidoptera, points out in connection with this species that in fresh specimens the wings are thickly powdered with yellowish scales; this feature is very noticeable in the examples captured, especially in the fore wings of the females.

Nisoniades tages.—Common, but in rather wasted condition, 5th to 19th.

Pamphila sylvanus.—Common after 14th.

Chrysophanus hippothoë.—This species was fairly plentiful in all the meadows round the town, and at considerable elevations above it. All the specimens seen were of the lowland form, varying, as commonly, in the degree of purple suffusion of the males, some of which are very splendid examples. The females varied very considerably, even from the same meadow, in the proportion of orange suffusion over the fore wings. Guillemot mentions the not infrequent occurrence of specimens in which the black dots on the under side are prolonged into dashes. Three specimens were obtained, one male and two females, in which this is well marked; in the two latter cases, however, on one side of the wings only. In another specimen, a male, all the black spots and their encircling pale rings are missing on the left hind wing (under side) with the exception of the marginal row. The females lay pretty freely on stems of sorrel; the resulting larvæ retired with much unanimity while still very small into withered leaves and crevices as early as the end of August, the cool, wet summer perhaps suggesting the near approach of winter, this being in great contrast to some examples in my possession in 1908, some of which fed up rapidly and endeavoured, though fruitlessly, to produce a second brood, two getting as far as pupation.

C. phlæas.—Two specimens, both wasted, June 7th and 21st.

Cupido minima.—One wasted specimen, 19th.

Nomiades semiargus.—Not common from 5th to 21st; very fresh specimens on both dates. Noticed *in cop.*, 14th, the male carrying the female in flight when disturbed.

N. cyllarus.—Two wasted specimens, male and female, 14th; one worn male, 19th.

Polyommatus alexis, Hb.—Common in meadows throughout the month. Very variable in size, and the females in absence or presence of blue coloration; both these factors were noticed by Guillemot from specimens in this district.

P. astrarche.—Not very common, 7th to 19th. The specimens much resemble those captured in Surrey in the size of the red spots.

Callophrys rubi.—One specimen, 14th; two, 21st.

Zephyrus betulæ.—Larvæ were obtained of this species on the scrubby roadside sloe bushes on the way to St. Sauves, west of la Bourboule. Contrary to the writer's previous experience of these larvæ (British or Swiss), a large proportion proved to be ichneumoned. This tendency hereabouts Guillemot thinks worth remark in his Catalogue. Oak bushes were examined and tapped in the hopes of finding other Theclid larvæ, but in vain; indeed, the astonishing freedom of this and other foliage from larval attacks of any sort, past or present, was very noticeable, especially when the recent aspect of the Kentish woodland and the ravages of larvæ therein was remembered.

Aporia cratægi.—First specimen, 13th; several seen, 19th.

Pieris brassicæ, *P. rapæ*, and *P. napi.*—All fairly common. No tendency towards the var. *bryoniæ* female of the last-named species was detected.

Euchloë cardamines.—Male, July 8th; one female, 14th. Both in good condition.

Colias hyale.—One specimen only, 8th.

C. edusa.—Not rare throughout the month, usually in poor condition.

Brenthis euphrosyne.—Pretty common though never abundant in the beautiful beech-woods on the south-west side of the town.

B. selene.—Rarer, but in fresher condition, 14th and 21st.

B. ino.—One only, a fresh male, in a damp meadow by the Dordogne, on the way to St. Sauves, 19th.

Melitæa parthenie. — A few very fresh examples on the 8th and 21st.

M. athalia.—Not common and, singularly enough, less fresh in appearance than the last-mentioned species.

M. dictynna.—One male, 19th.

Pyrameis cardui.—One wasted specimen, 8th.

P. atalanta.—One, 21st.

Aglais urticæ.—A few fresh imagines; larvæ plentiful.

Pararge mæra.—Here and there on rocky roads west of the town. The examples taken are slightly under-sized, and the markings inclined towards, though not quite corresponding to, the var. *adrasta.*

Epinephile ianira.—One specimen, 18th.

Erebia stygne.—The only *Erebia* met with, with the exception of one wasted *E. cassiope* from the Charlanne Forest, on the 26th. *E. stygne* was fairly common, especially on the St. Sauves road; only males were observed, all in very fresh condition.

Cœnonympha pamphilus.—Common everywhere.

C. arcania.—One specimen, 21st, Charlanne Forest.

The above list could no doubt be largely augmented by an active entomologist in a more favourable season; at the same time the comparative scarcity in numbers of even the commonest species seen during the (all too rare) intervals of really warm sunshine hardly point to the district being a very rich one, though possibly a later period in the summer would prove to be a better time for visiting it.

From the point of view of scenery, the place offers a very charming variety in all directions.

Brasted Chart, Kent.

BUTTERFLIES OF CANTAL AND LOZÈRE.

By H. Rowland-Brown, M.A., F.E.S.

A correction of mine made in revising this paper for press (vol. xlii. p. 297) was, by some oversight, not included. In the footnote descriptive of the ab. *escherinus* it should have been stated that this form of *Polyommatus escheri*, taken by me at Mende (the male) and at St. Martin-Vésubie (the female), appeared to be transitional to the ab. *subtus-impunctata*, Oberth. ('Études de la Variation chez les Lépidoptères,' livr. xxme., pl. iii. fig. 25). In this form from Barcelona, the whole of the under side black markings have disappeared, and I expect that it is the example "depourvu en dessous des points ocellés" exhibited before the Entomological Society of France, December 9, 1863 (Bull. Ent. Soc. Fr. 1863, lii.). I may add that M. Charles Oberthur (*op. cit.* pl. iii. fig. 39) figures the form of *P. eros*, included in my illustration, as ab. *subtus-radiata*.

Chrysophanus alciphron, var. gordius, ab. ♀ midas, Lowe.—I wish also to say that my friend the Rev. F. E. Lowe, the original author of this aberration, has written to me pointing out that in a previous paper of mine, where an under side aberration of the species is described, which also corresponds with the ab. *escherinus* taken at Mende, I have fallen into an error; the ab. *midas* being an aberrational form of the *upper* and not of the *under* side. On reference to the Rev. G. Wheeler's 'Butterflies in Switzerland' (p. 16) I find this to be the case; and, to put the matter straight, I cannot do better than quote the communication which Mr. Lowe has been good enough to make to me. He writes:—

"Mr. Rowland-Brown describing an entomological visit to 'The Basses-Alpes in August' (Entom. xli. p. 262) describes an interesting aberration of the *under side* of *C. alciphron* var. *gordius*, comparing it with the ab. *cinnus* of *P. bellargus*. On p. 296 he says: 'This ab. appears in every respect to correspond with ab. female *midas*, Lowe.' From which it is evident that from a chance misreading he has got a mistaken idea of this aberration. As the same mistake occurs again in 'Butterflies of Cantal and Lozère' (*ante*, vol. xlii. p. 300), it seems better to correct it lest it should become stereotyped.

"Ab. *midas* is not an aberration of the *under* side of *gordius*, but of the *upper*. Its peculiarities consist in the entire absence of black spots on the upper side of the primaries with the exception of the two large discoidal spots. The black border is very broad and entire until just before the anal angle, when it opens out and makes one large blotch. The hind wings have the disc clear with the exception of a black discoidal spot. The ante-marginal band, which usually in *gordius* consists of two or more rows of irregular spots, is in *midas* formed by the confluence of these spots into wedge-shaped dashes, and is suggestive of the markings of *C. dispar* var. *rutilus*. This row of black wedge marks is reproduced on the under side."—[Frank E. Lowe.]

DESCRIPTION OF A NEW GENUS AND SPECIES OF *OXYURA* (HYMENOPTERA) FROM KUCHING, BORNEO.

By P. Cameron.

Laccomerista, gen. nov.

Antennæ thirteen-jointed, placed near the mouth, on a swelling, which is obliquely sloped below them, its edges below each antennæ projecting into a stout tooth, longer than wide; the apex is oblique. Head as long as it is wide at the vertex; the temples obliquely narrowed, wide, the occiput transverse, stoutly margined, as are also the cheeks. Eyes oval, the malar space half their length; a keel runs from their top on the inner side to the antennæ. Ocelli in a curve. Pronotum large, almost twice longer than wide, narrowed towards the base; the latter is narrowed, clearly separated, and bears two broad rounded keels, separated by a distinct furrow. Parapsidal furrows distinct, complete. Scutellum large, almost flat, separated from the mesonotum by a narrow furrow. Metanotum short, its apex with a rather steep, oblique slope. Abdomen oval, shorter than the thorax, roundly convex above, flat below: the second segment very large, much larger than all the rest of the abdomen. Wings with a large, wide stigma, rounded behind; the radial nervure is short, oblique, straight, and issues from the apical fourth of it; there are two distinct basal cellules, the posterior being shorter than the anterior. Legs stout, the calcaria short, slender. Spurs small, simple. Hind tibiæ thickened towards the apex, which above ends in a short spine. Metatarsus stouter than the following two joints united. Tegulæ large, longish. Antennal flagellum stout, longer than the following three joints united, and reaching above the top of the head; the pedicle as wide as long; the following joint clearly longer than the next; all the joints elongated. The form of the mandibles I am unable to make out, and I have not a spare example for dissection; neither can I make out the exact number of abdominal segments, of which I can only detect five. There are two spurs on the four posterior tibiæ. The scutellum is almost square, and is bounded laterally by a furrow.

On the whole this new genus fits best into the Bethylidæ, but it has not the one-jointed trochanters of that group, so far as I can make out. The neuration is more, in some respects, that of the Scelionidæ, e. g. *Calliscelis*; certainly the form of the radial nervure differs from what it is in the Bethylidæ, in which it is more or less roundly curved. The form of the head is different from what it is in the latter, being shorter, not flattened, and lenticular. Characteristic is the form of the prothorax, particularly the stoutly bicarinate basal part. Probably the discovery of the other sex will throw some light on the affinities of the genus.

Laccomerista rufescens, sp. nov.

Rufous, very smooth and shining, bare, the flagellum of antennæ covered with a microscopic white down; wings brownish smoky to shortly beyond the middle, the rest more slightly smoky, especially in front, where there are hyaline streaks, the nervures reddish fuscous; the second (and shorter) basal cellule is rounded at the apex, where it is wider than it is at the base; the wings are highly iridescent; tegulæ smooth and shining; a short oblique nervure runs from the middle of the second basal cellule. Tibiæ and tarsi (and especially the posterior) covered with fuscous pubescence. The apex of the abdomen becomes gradually narrowed. ♀. Length, 3 mm.

Kuching, Borneo (John Hewitt, B.A.).

VARIATION IN *VANESSA URTICÆ*, L.: SEASONAL (CLIMATICAL) AND LOCAL VARIATION IN *V. URTICÆ* AND IN *V. IO*, L., BY WHICH THE TWO SPECIES SHOW A TENDENCY TO MEET IN FACIES.

By T. Reuss.

(Continued from vol. xlii. p. 313.)

Fig. 8, female, perhaps trans. ab. *bolandii*, Lmblln., has narrow wedge-shaped lunules, which move away from the fringe instead of approaching it as in fig. 7.

In fig. 9, male, the first costal lunule disappears, the other costal lunules float yet further away from the fringe, and present an aspect reminding of the disintegrated ocellus in the aberration of *V. io*, which I figured in September (vol. xlii. p. 223), especially as the black basal parts *approach the costal* lunules, but *recede behind the anal* lunules.

An extreme case of this latter *io-form* detail, which confines the reddish ground colour (that is, of the same peculiar tint found in light-coloured specimens of *V. io*) to the anal parts of the wing, as in *V. io*, is shown in fig. 10, the hind wing of ab. *ioprotoformis*. Here the chain of lunules is already broken up, the first costal and the anal lunules disappear, so that only the three large costal lunules remain, which are the same that coalesce into an ocellus in *V. io*. Further *io-form* details of this specimen, the description of which I now complete, are: the under side is brown-black, also the median area of the fore wings being wholly irrorated with dark brown. On the upper side of the fore wings the median puncta, as well as the inner marginal blotch, are obsolete.

The costal blotches are united, as in *V. urticæ* ab. *atrebatensis*, Boisd., or in *extreme* forms of *V. io* ab. *belisaria*, Obth.

Held against the light the wings are much less transparent than in typical *urticæ*, and therefore approach in opaqueness the wings of *V. io*. The *long slender shape* of the wings appears also in aberrations of *V. io*. The antennæ, instead of being chequered with black and white, are uniform brownish in colour, and therefore more like those of *V. io* than of *V. urticæ*.

I had exposed the pupa of this *io-form* aberration, together with some others, during three days after pupation to temperatures occasionally as high as 48° C., in the endeavour to strike at and impair the "fixed" hereditary tendencies before these should have found time to determine the facies on the usual *palæ-form* lines.* Afterwards the pupæ were climatized in almost tropical conditions, so as to further influence any new lines of development which might be in progress, in the hope of *immediately* effecting such a high degree of change in the facies as would by the only other possible method—that of utilizing the hereditary forces—take years to attain.

When the imagines ultimately emerged I found that only two had defied hereditism during pupal development; they were the last to emerge (after ten days), and one was the *io-form* aberration described. On the rest of the pupæ hereditism had in a great measure retained its hold. The specimens were only slightly *io-form*, being more or less transitory in markings and colour to the Corsican variety *ichnusa*, Bon., and to the Asian form *chinensis*, Leech, transitions to the all-brown, irrorated under side of the latter appearing in two of my aberrations of *urticæ*.

* I suggest that the colours in the facies of a butterfly are greatly dependent in their kind and distribution on the manner in which the diffusion of the blood (pigment) into the wings is influenced by the pressure on the blood from the vital process in the pupa. An aberration like that described would have developed under abnormally high blood pressure, following after a temporary interruption of the vital process by extreme temperature. The overflow of black colour along the main ducts of the fore wings is symptomatic of this, and tells of the overthrow of hereditary tendencies, though the phylogenetic value of a specimen *may* in a sense be impaired by such symptomatic details (which, by the way, besides an *only occasional* infertility of the sexes, seem to offer the only and perhaps insufficient excuse for referring aberrations to teratology). I have already, in my description of ab. *ioformis* in the Ent. Record, pt. iv. 1909, tried to show that these details may occur together with and be distinguished from progressive or atavic features of the facies. It is, however, often a very complicated and even impossible matter to separate such features, because when, for instance, an *urticæ*-aberration is facially transitory to *V. io*, such a facial detail as the absence of the median puncta on the fore wings is at once symptomatic, progressive, and atavic.

In speaking of the biological significance which might underlie an *io-form* facies, appearing by saltation in a specimen of *urticæ* reared from wild larvæ, it will be necessary to distinguish whether the present and future only or otherwise the past history of such facial *io*-formity is under consideration.

In the first case I suggest that the *io-form* facies, even if it occurred and were developed to perfection in an isolated group of *urticæ*, would not be followed by physiological changes of *such* a nature as would link the variety also specifically to *V. io.* Unless it should be proved that a certain kind of facies is entirely bound up not only with a certain kind of physiological structure, but also with a certain sexual affinity, there is no reason to assume that *facial io-formity* also entails *specific io-formity.* At present it would appear that every variety which becomes separated from the type will within its own special group be quite free to vary—for instance, in the structural details of the sexual organs *independently of the facies.* Thus, while from a locally isolated group of *urticæ* an entirely new species, *facially resembling V. io,* might be evolved, it would also be thinkable that another isolated group of *urticæ* had remained *typical in facies,* but grew to a greater size, and became specifically distinct from the type by extreme development of otherwise varietal changes in the larval habits,* and especially in the female sexual scent, male ancillary appendages, &c., of the imagines; while yet another (seasonal) group could have become completely changed in facies, *io-form* again, for instance, and yet be *specifically unchanged.*†

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* Longer feeding-up time under the influence of cold, or *not* proportionately accelerating the feeding-up time in a temperature higher than normal, is well-known to be conducive to a considerable increase in size (Elwes, Standfuss). This also explains why northern *or* southern forms of some central European species are *both* often notable for comparatively great size. The climate on mountains sometimes has a similar effect.

† Taken *strictly*, the scientific conception of "species" is based on, and will accept no other evidence than that of, *unlimited fertility* (based in its turn on sexual affinity) among the individuals of one group to mark them "species." The transmittability of any special facies by hereditism is not necessarily dependent on any special structural details of the genitalia, &c., nor is the fertility of a specimen with an aberrative facies in any way impaired merely by the possession of that aberrant facies. Every breeder of *facial* varieties by *artificial selection* testifies to this by his success. Also Prof. Standfuss *first* proved in 1897 by pairing aberrant *urticæ* obtained by exposure of the pupæ to low temperatures that the altered facies of a "temperature form," resulting from an experiment with pupæ from wild larvæ, is transmittable by progressive hereditism in a small percentage of the brood *even under normal conditions* of temperature. The fertility of the specimens was unimpaired. Therefore the aberrant facies produced by the effects of temperature had (*a*) become potentially inherent in the spermatozoa and ova, (*b*) and this without necessitating an alteration in sexual affinity. Moths which breed freely in captivity offer better proofs than the Rhopalocera. Thus the best way to start breeding varieties successfully from normal wild specimens—for instance, of *A. grossulariata*—is to produce a few aberrations

It is, for instance, well known, from numerous examples in the field, that imagines almost identical in facies may be specifically distinct (for instance, *V. polychloros-xanthomelas*), while other forms bearing not the slightest outward resemblance to one another facially are representatives of one and the same species. It would perhaps be difficult to find an entomologist to-day who does not know the striking examples of merely facial divergence afforded by extreme cases of seasonal dimorphism. There is, for instance, the orange black-spotted *A. levana* and its summer (heat) form, the black white-banded ab. *prorsa*. I shall not forget the shock I got when, as a boy with primitive notions of entomology and possessed of a wild desire to find as many "different kinds" as possible for my collection, I was for the first time shown the orange *levana* and the black *prorsa* together, and then told that these two flies were of one and the same "species," and lived and paired, the one in May, the other in August! What little entomology I had managed to tuck into my brain got loose then, and when I had also seen several forms of ab. *porrima*, intermediate between *levana* and *prorsa*, my notions about butterflies went scattering to the winds. But I did not give up; I thought it worth trying to understand. So afterwards I went about gathering in the bits again, and then already I made a discovery. I found that I had lost one thing—evidently for ever—and that was my delightfully irresponsible belief in the "constancy" of "species." But, to use a metaphor which was very popular in the biological battles which raged on the Continent only lately, though "the bath with the child had been overturned," I did manage to save the child. I only lost the water, and that was well spilt.

Ever since that time I have taken more delight in collecting "shocks" than butterflies, and I have, for instance, risked the "cabinet quality" of the best aberrations which I reared, in order to study their appearance and flight in the open field. So far I find that I lose or damage very few specimens, but that the harvest in "shocks," even in this one instance, is very great and very calming. At least, when one comes to realize that a single apparently "constant" British species—*Vanessa urticæ*, L.—is evidently capable of producing a far greater number of different and beautiful varieties than there are different species of Rhopalocera in the whole of England, then one soon begins to take "shocks" naturally; and, after all, it is only "thought fixed by custom" that could prevent one from thus taking any un-

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from the wild larvæ (among different broods to prevent later stagnation) by a moderate temperature experiment, and then to breed from these forms, relying on the cumulative effects of hereditism for further variation. In the case of, for instance, var. *varleyata*, it should not be distinguishable whether the specimen was produced by temperature effects or by hereditism. When both factors combine, then the most extreme forms result.

expected but natural phenomena in insect-life. Or else why is one comparatively so little stirred by the marvels of *sexual* dimorphism if it is not because he is accustomed to these phenomena, almost from the very moment that he acquired conscious sight in earliest childhood by the familiar examples in picture-books, pets, and the useful domestic animals? I remember —before I ever had looked into a butterfly book—showing as a "new different" species my first examples of the real "butter-coloured" fly, pinned in a separate box, and then being only mildly astonished and rather ashamed at my ignorance and want of penetration when it was pointed out to me that my beautiful "yellows" were identical as a species with certain greyish-greenish butterflies which I had placed among the "common whites" because of their colour! This my first experience of extreme sexual dimorphism in entomology did not shake me up like my later meeting with *levana* and *prorsa*; it seemed quite "matter of course"!

(To be continued.)

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By Claude Morley, F.Z.S., F.E.S.

(Continued from vol. xlii. p. 278.)

43. Pulvinaria.

From a species of this genus upon Oregon flowering currant Ashmead (p. 387) records *Aphycus oregonensis*, How., and from another, from Iowa, his *A. pulvinariæ* (p. 388).

44. *Pulvinaria vitis*, Linn.

This well-known pest is destroyed by a variety of parasites in Europe and America. First, Curtis records (Brit. Ent. pl. et fol. 395): "For specimens of this insect [his *Encyrtus vitis*] I am indebted to Mr. Samouelle, who bred them from the *Coccus* of the vine. Found on the vine in Lambeth, July 9th and 10th, 1830." Next, Goureau (Ann. Soc. France, 1863, Bull. p. iv.; quoted by Gaulle, 109) bred *Eulophus scutellaris*, Nees. And in 1875, Dr. Mayr gives *Encyrtus duplicatus*, Nees; *Blastothrix schönherri*, Westw.;† *Aphycus puncticeps*, Dalm., which also occurs in the United States; and *Ericydnus paludatus*, Walk. (*? ventralis*, Dalm.) (Verh. z.-b. Ges. pp. 708, 699, 696 et 764); but the commonest enemy is probably *Eucomys swederi* (*l. c.* p. 741), as quoted by Gaulle, who also mentions Rondani's record hence of *Pachyneuron coccorum*, Linn. (Bull. Soc. Ent. Ital. 1877, p. 181), as well as *Eunotus cretaceus*, Walk., which appears to me to be synonymised by him with *E. obscurus*, Giraud, recorded from this host at Ann. Soc. France, 1877, p. 427.

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† Quite the most circumstantial account of parasitism upon Coccids I have seen is given by Newstead, who says (Mon. Brit. Coccids, ii. 66):—"When the colony of *Pulvinaria vitis* var. *ribesiæ* under observation was first established, the insects were quite free from internal parasites. But the second generation became infested by chalcidid parasites, which increased in the third generation to such an enormous extent that quite fifty per cent. of the coccids were destroyed by them. The few coccids which now remain are apparently all parasitized. . . . . On the 17th of October, 1901, after long and careful watching, I observed one of the chalcidid parasites in the act of laying its eggs in the body of a coccid. When first seen the parasite was running

45. *Pulvinaria carpini*, Linn.*

Four parasites were bred from this species by Dr. Mayr (Verh. z.-b. Ges. 1875): *Microterys cyanocephalus*, Dalm. (p. 707; quoted by Ashm.); M. *lunatus*, Dalm. (*Cedrenus*, Walk.) (p. 706; quoted by Galle); *Aphycus apicalis*, Dalm., and *Eucomys obscura*, Dalm. (pp. 695 et 741; quoted by both). Gaulle also mentions hence *E. scutellata*, Swed. (Cat. 98).

46. *Pulvinaria betulæ*, Linn.*

We appear to have added nothing to our knowledge of this species' parasites since 1820. Nees (Mon. Pterom. 206) says of *Encyrtus sylvius*, Dalm.: "Exclusam e *Coccis Betulæ* albæ Vestrogothiæ feminam abservavit Dalmanus; e *coccis Pruni* Frischio olim prodierunt ejusdem speciei exempla." Ratzeburg, however, is sceptical, adding (Ichn. d. Forst. i. 212): "This is

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swiftly from place to place, evidently searching for a suitable host; its antennæ were bent downwards almost at right angles to the long scape forming their basal half, and were moved up and down rapidly and alternately, the tips each time touching the path of the insect as it progressed. Many coccids were examined, and when a suitable one was found the parasite turned its head towards the anterior extremity of the coccid, and, resting with all its feet upon the body of the latter, inserted its ovipositor into the centre of the thoracic area; it then slowly moved its abdomen up and down, and apparently laid its eggs in the puncture; the parasite then withdrew its ovipositor, and, turning round abruptly, feeling its way again with its antennæ, seized with its jaws the lips of the wound made by the ovipositor, and distinctly closed them upon it and apparently pressed the edges together; finally it passed the palpi over the wound, and then left the coccid to its fate. I subsequently saw the process of ovipositing repeated by three different individuals, each one acting precisely the same as the first." Mr. Newstead states (*lib. cit.* p. 252) that Dr. Howard considered this parasite to be "probably *Blastothrix sericea*, Dalman," of which the latter remarks that it "was reared by Kollar from coccids on *Tilia* and *Prunus*, as well as on *Æsculus*, *Acer*, and *Corylus*. Reinhard and Tschek also reared it from bark-lice on plums and on *Carpinus*. Probably all these scale-insects belong to the *Lecanium* group. In this country (U. S. A.) we find *Blastothrix* nearly always coming from *Lecanium*, and this is the same with the comparatively few exotic species. *Blastothrix longipennis*, for example, has become rather widely distributed commercially, and is parasitic upon various species of *Lecanium*." The most remarkable incident in this account is the manner in which the puncture was subsequently dressed, and I can recall nothing quite like it in any work on the Parasitica.—C. M.

supposed to be the species which Frisch (Beschr. v. Ins. Deutschl. Th. ix. p. 37) described as parasite in the brown egg-galls on plum and cherry trees, and which Dalman claims also to have bred from birch *Coccus*." Ashmead, however (1900, p. 393), records *Microterys sylvius*, which occurs both in Europe and United States of America, from both hosts without comment.

47. *Pulvinaria innumerabilis*, Rathv.*

Four parasites are enumerated from this species in America: *Coccophagus flavoscutellum*, Ashm. (How. Revis. 1895, p. 36); *C. lecanii* (*l. c.* 33, described by E. A. Smith, 'American Naturalist,' 1878, p. 661, from the synonymous *Lecanium acericorticis*, Fitch); *Aphycus pulvinariæ*, How. (Report Ent. U. S. Agric. 1881, p. 365); and *Atropates collinsi*, How. (Ashm. 1900, p. 405), from New York.

48. Lecanium.

I have no fewer than thirty-seven records of Hymenoptera bred from unidentified examples of this genus. These may be compressed thus:—From Europe are four; Dalla Torre credits Ratzeburg with breeding *Coccobius annulicornis* from this genus, though at Ichn. d. Forst. iii. 195, the latter simply gives "*Coccus*," but Howard has found the allied *C. ochraceus* to attack it (Revis. 1895, p. 38); *Eucomys* (which genus Ashmead says should fall to *Encyrtus*) *lecaniorum*, Först., was raised hence by Dr. Mayr (Verh. z.-b. Ges. 1875, p. 740), together with *Blastothrix erythrostethus*, Walk. (*l. c.* p. 699); and Gaulle tells us (Cat. 99) that *Cerapterocerus mirabilis* also has been bred from species of this genus. In America much has been done since Howard's 1881 Report Ent. U. S. Agric., where he includes his *Blastothrix adjutabilis* (p. 365), *B. incerta* (p. 366), *Aphycus eruptor* (p. 364), *Chiloneurus albicornis* (p. 363), *Eucomys fusca* and *Astichus minutus*, Comst. In 1885 Ashmead contributed (Trans. Amer. Ent. Soc. Proc. p. xix.) his *Tetrastichus lecanii*, and Howard (Descr. N. Amer. Chal. pp. 25 et 17) his *Coccophagus flavifrons* and *Chiloneurus dubius*, as well as (p. 12) *Encyrtus sublestus*. To this list Ashmead adds in 1900 *Encyrtus fuscus*, How., *Aphycus annulipes* from *Lecanium* on oak, *A. californicus* from *Lecanium* on *Adenostoma fasciculatum*, *A. flaviceps* from Illinois, *A. fuscipennis* from *Lecanium* on *Arctostaphylos pungens*, *A. johnsoni* from *Lecanium* on elm, *A. maculipes* from *Lecanium* on water oak, *A. lecanii* from others on *Pinus insignis*, *Heteromeles arbutifolia*, and *Quercus agrifolia*; and also instances his *Eusemion longipennis* and *Psilophrys longicornis*, Walk., as attacking members of this genus. Newstead remarks upon his breeding several specimens of an apparently new *Aphycus* (Brit. Coccids, i. 31) from its members.

49. *Lecanium liriodendri*, Gmel.*

From the synonymous *L. tuluiferæ*, Hill, Howard records *Leucodesmia typica* ('Insect Life,' 1895, p. 404) and *Coccophagus flavoscutellum*, Ashm. (Revis. p. 36).

50. *Lecanium capreæ*, Linn.

Eunotus cretaceus, Walk., is recorded from this species by Gaulle (Cat. 103), who also mentions *Chiloneurus elegans*, Dalm., from a *Lecanium* on *Salix* (p. 99). The synonymous *L. tiliæ*, Linn., is recorded (*l. c.* 98) as host of *Eucomys obscura*, Dalm., and (p. 99) of *Blastothrix sericea*, Dalm., while Kawall adds (Stett. Ent. Zeit. 1855, p. 231) *Eucomys scutellata* to its parasites, and Newstead has an interesting note "On the Alteration in the Form of the Scales of *Lecanium* caused by Internal Parasites" (Ent. Month. Mag. 1892, p. 267). Both *L. alni*, Modeer, and *L. æsculi*, Kollar, belong here; regarding the former, I am only aware of Gaulle's record (Cat. 99) of *Aphycus punctipes*, Dalm., from it, but the latter is freely parasitized by *Microterys chalcostomus*, Dalm. (Mayr, Verh. z.-b. Ges. 1875, p. 706), *M. sylvius* (*l. c.*) and *Blastothrix schönherri*, Westw. (*l. c.* p. 699), to which Ashmead (1900, p. 390) adds *B. sericea*, Dalm. (*longipennis*, How.), a common species both in Europe and Northern America.

51. *Lecanium hesperidum*, Linn.

Gaulle states (Cat. 99) *Blastothrix sericea*, Dalm., preys upon the "Orange Scale," while in America Howard has recorded *Eucomys bicolor* and *Encyrtus flavus* (Rep. Ent. U. S. Agric. 1881, pp. 362–7), *Perissopterus mexicanus*, *Coccophagus cognatus*, *C. flavoscutellum*, Ashm., and *C. lecanii*, Smith, from it (Revis. 1895, p. 33, &c.). Ashmead (1900, p. 360) adds *Encyrtus bicolor*, How., from America, and *Aphycus alberti*, How., from New South Wales, to the parasites of this species, which is abundant in British greenhouses.

52. *Lecanium aceris*, Bché.*

From the *Coccus* of *Acer platanoides*, Dalla Torre gives *Eucomys scutellata*, Swed. (*cf.* Kawall, Stett. Ent. Zeit. 1875, p. 231). Ratzeburg records his *Encyrtus atricollis* from moths (Ichn. d. Forst. i. 213), but later (*l. c.* iii. 190) from *Coccus aceris*, whence he also states (*l. c.* ii. 149) that Hr. Bouché bred *Coccobius pallidus*. Rondani is also said by Dalla Torre to have reared *Encyrtus infidus*, Rossi, from it, but without reference; Gaulle adds *Aphelinus insidiator*, Dalm. (*obscurus*, Westw.), *A. scutellaris*, Dalm., *Eucomys scutellatus*, Swed., *Sceptrophorus cyaneus*, Dalm., *Microterys sylvius*, Dalm., and *Pachyneuron coccorum*, Linn.

53. *Lecanium pruni*.*

Nees von Esenbeck writes of *Encyrtus æruginosus*, Dalm.

(Mon. Pterom. 235): "In *Coccis pruni* gregarium legit Geerus" (*cf.* De Geer, Ins. ii. 190). Ratzeburg found his *Encyrtus coccophagus* to be the chief parasite of *Coccus pruni* (Ichn. d. Forst. ii. 148). The only species bred from it by Mayr (Verh. z.-b. Ges. 1875, p. 206) was *Microterys sylvius*, Dalm., which has since been also raised in the United States of America. Gaulle adds *M. lunatus*, Dalm., *Eucomys scutellata*, Swed., and, from "Coccids of Prunus," *Ericydnus longicornis*, Dalm.

(To be concluded.)

NOTES AND OBSERVATIONS.

The Taps of the "Death Watch Beetle."—Stephens says in his 'Manual' that *Anobium striatum*, Oliv., is to be taken from April to August; and doubtless most coleopterists would be quite willing to accept the statement as correct, because the species is so common that few have troubled to notice its times of occurrence. I have recently been jotting down notes upon the Braconidous parasite of this injurious beetle (*Spathius exarator*, Linn.), and was surprised to note that both host and parasite put in no appearance till July 3rd, when both began to be very common on the posts in my stable here. On referring to the series of this species in my collection—which is not complete—I find that the dates range only from June 21st to July 15th; it would be of interest if coleopterists would give us their experience of the span allotted to perfect *A. domesticum.*

It was, consequently, with some surprise that I heard the familiar tapping of this beetle in an old oak bureau, I had but just acquired, in my study on October 16th last, and, bearing in mind the statement made in a recent popular article on the insect to the effect that only four or five taps were given in succession—it had struck me as incorrect when I read it ('Strand Magazine,' 1909 (Oct.), p. 475; a similar statement is made, if I remember aright, by Darwin in 'Origin of Species')—I drew my watch and awaited a repetition. The first series of taps had occurred at dusk; and I caught the second at 5.23 p.m.; this lasted from seconds 48–57, and was followed by other series of continuous taps at intervals of less than a minute thus:—37–52, 23–33, 5–15; then came over a minute's silence, and after it:—35–44. Next came a longer interval of silence, lasting from 5.28 to 5.32, followed by a last succession of taps:—20–28. No more were heard that night, nor since.

I attempted to count the taps, but they were too numerous; often one is enabled to count such quick successions of sound by simply listening to them in the first place and afterwards counting them by repeating the sound over again more slowly; but this was too quick, and I could do no more than guess the number to be approximately thirty or forty. Everyone is familiar with this portentous hammering of one's coffin nails (they used nails when they believed in Death-Watches!), and the fact that the successions of taps occupied an average time of almost exactly ten seconds each is ample proof of their multiplicity.—CLAUDE MORLEY.

EMERGENCE OF THE SECOND GENERATION OF EUSTROMA (CIDARIA) SILACEATA.—Two batches of ova of *E. silaceata* deposited by females of Huntingdonshire origin were received in May last. Larvæ from one of these batches commenced hatching out on May 21st, and from the other a week later. On June 16th, the larvæ, about fifty in number, were transferred from boxes to a roomy breeding cage, and pupation began a few days later, but it was not until about July 6th that all the larvæ had spun up.

A female moth emerged on July 2nd, and another example of the same sex appeared on the 4th; between the latter date and August 3rd seventeen specimens in all had emerged. On August 14th, twenty-six pupæ were removed from the breeding cage and placed in a glazed tin box. At this time a few eggs and several eggshells were found fixed to shreds of dried foot-plant (*Epilobium*) at the bottom of the cage. The eggs were placed in a separate box but only one larva hatched therefrom, and this would not feed. Between August 21st and September 14th seven males emerged, and on the 17th an example of each sex appeared in the box (pairing was not observed, but eggs were laid during the nights of the 18th, 19th, and 20th). A male emerged on September 16th, followed by a female the next day. On the date last mentioned there were still about a dozen pupæ but no other moth emerged therefrom until October 9th, when a female appeared. The remaining pupæ did not exhibit any indication of the emergence of moths up to Nov. 7th, but between that date and the morning of Nov. 20th, when they were again looked at, two females had emerged; one was dead but quite limp, the other very much alive and apparently just out.

From the ova deposited September 18th–20th larvæ hatched out September 28th to October 6th, and all but one had pupated by the end of October; the laggard was seen alive on November 3rd, but it was found dead on the earth under a leaf on November 7th.

As will be seen from the above jottings, moths of the second generation have been emerging, one or two at a time, over a period of twenty weeks; and curiously the first two imagines (July 2nd and 4th) and the last two (between November 7th and 20th) were females.—RICHARD SOUTH.

RETARDED EMERGENCE OF VENILIA MACULATA, L.—In 1906 I obtained ova from a wild parent taken in this district, larvæ hatched, fed up, and successfully pupated. Several imagines emerged in 1907, a few in 1908, and just a few more in 1909, the latter having lain over for three years. The breeding-cage in which they were reared contained no other species; it was kept in a cold room and in the same place throughout. I can find no previous record of this species having lain over in the pupa state even for a second year, which makes the fact of some having lain over a third year the more worthy of record.—W. A. ROLLASON; "Lamorna," Truro, Cornwall, December 13th, 1909.

POLIA XANTHOMISTA, Hb. = NIGROCINCTA, Tr., IN CORNWALL.—I have previously recorded in the 'Entomologist' (vol. xxxix. p. 292, and vol. xli. p. 273) captures of this insect, and have now to record in addition the breeding of same from wild ova obtained in 1908. Larvæ hatched out during April and May of this year, and were fed indoors, until after second moult, on buds and young leaves of a common plum-tree, after which they were sleeved outdoors in my garden on the plum-tree from which the early buds, &c., were obtained. At the bottom of sleeve I placed a good quantity of moss, in which the larvæ could hide by day and be sheltered from the hot sun, rains, &c. During August I opened the sleeve and found a number of cocoons among the moss from which emerged half a dozen fine insects, two males and four females, between August 31st and September 12th last, all being of the average size of the wild insects I have taken.—W. A. ROLLASON; "Lamorna," Truro, Cornwall, December 13th, 1909.

LATE EMERGENCE OF PLUSIA GAMMA.—About the middle of November Mr. F. E. Beddard, F.R.S., Prosector to the Zoological Society, informed me that he had noticed a perfectly fresh and apparently newly emerged specimen of the above moth on the outer wall of the deadhouse in the Society's Gardens in Regent's Park. Beyond noting the fact that the period of emergence appeared to be abnormally late no further notice was taken at the time, but a few days later I had forwarded to me another specimen, also in a very good condition, which had come into a room, attracted by light, in a house in the Marylebone Road on November 24th. The two records taken together seem to point to an abnormal retardation in the development of the species this year, possibly attributable to the prevalence of generally low temperatures throughout the past summer.—R. MELDOLA; 6, Brunswick Square, W.C., December 10th, 1909.

A NEW CATALOGUE OF THE COLEOPTERA OF THE WORLD.—The present number of described species of Coleoptera being about two-thirds greater than it was some thirty years ago, when Gemminger-Harold's 'Catalogus Coleopterorum' was published, the need of a new catalogue must be admitted. We have received a copy of the first part of the 'Coleopterorum Catalogus,' a work produced by Herr W. Junk of Berlin. The editor of this important work is Herr S. Schenkling, and among the contributors we notice the names of several well-known British specialists. The family treated in Part 1 is the Rhysodidæ, and the author Herr R. Gestro. We understand that Parts 2–9 are in the press.

BRITISH SPIDERS.—As the Arachnida are occasionally adverted to in our pages, we may mention that in the 'Transactions' of the Hull Scientific and Field Naturalists' Club, vol. iv. part ii., Mr. T. Stainforth gives a list of East Yorkshire Spiders, Harvestmen, and Pseudoscorpions added to the Hull Municipal Museum Collection in 1908.

BRITISH HOMOPTERA.—Mr. Oscar Whittaker contributes "A Preliminary Catalogue of the Hemiptera-Homoptera of Lancashire and

Cheshire" to the (thirty-second) Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society for 1908.

British Odonata.—In the 'Journal of the R.H.S. Garden Club,' No. II., 1909, there is an annotated list of dragonflies found in the county of Surrey, contributed by Mr. W. J. Lucas.

The Oribatoidea of Illinois.—In an article bearing this title Mr. Henry E. Ewing discusses the classification of the Oribatoidea, describes thirty-three species (twelve new) from Illinois, and gives a list of all the species known to occur in North America. This article was published in the 'Bulletin' of the Illinois State Laboratory of Natural History, vol. vii. pp. 337–389, plates xxxiii.–xxxv. (September, 1909).

Fossil Insects.—Prof. T. D. A. Cockerell (Bull. Amer. Mus. Nat. Hist. xxvi. pp. 67–76) describes several new species of Diptera from the Florissant Shales; also a new species of *Raphidia* (Neuroptera), and one of Orthoptera. Photos of five of the new flies are shown on plate xvi.

The same author contributes "A Catalogue of the Generic Names based on American Insects and Arachnids from the Tertiary Rocks, with indications of the Type species" (*l.c.* pp. 77–86).

Leucania favicolor on Hackney Marshes.—Among the *L. pallens* in the second portion of Mr. J. A. Clark's collection dispersed at Stevens's last week was a specimen of *L. favicolor*, which evidently escaped the notice of most buyers. This specimen is most interesting as it is labelled "Hackney Marshes 2 vii. 05." Now one looks on *L. favicolor* as a coast species, and one would not expect to find it at Hackney. Of course we know that these marshes in olden times were tidal, and the fact that *Hama* (*Mamestra*) *abjecta* sometimes occurs there makes one wonder if the old salt marsh insects have hung on there in spite of these marshes being no longer of the old character. I am not overlooking the fact that it is not so very far across to the Thames, and that these insects could fly across if they came up the river.—H. M. Edelsten; Forty Hill, Enfield, December 14th, 1909.

The Clark Collection. — On December 7th and 8th a further portion of the collection of British Lepidoptera, formed by the late Mr. J. A. Clark, was disposed of at Stevens's Auction Rooms. It consisted chiefly of the more recent acquisitions of its late owner, and although perhaps hardly so rich in extreme forms as the older portion, it nevertheless contained a large number of really good varieties and a larger proportion of the specimens were labelled with more or less complete data. The chief interest appeared to centre round some of the more remarkable forms, and, as on the former occasion, some of the Continental collectors were desirous of obtaining a share of them, but whereas then practically the whole of them were secured for one or another of our British collections, some few out of this later portion appear to have been more highly appreciated by our neighbours, and thus to have found their way across the Channel. The first lot to raise any great amount of enthusiasm was "a curious gynandromorphous specimen" of *Gonepteryx rhamni*, which soon ran up to £4 5*s.*; then came several nice *Argynnis selene*, among which "a remarkable variety both on upper and under sides" brought £3 5*s.*; a fine pale variety, £2; a heavily blotched specimen, £4 8*s.*; "an extraordinary dark variety," £5 10*s.*; a black-dusted Sutherlandshire specimen, £4; a rayed under side (figured in South's 'Butterflies,' pl. 56, fig. 3), £5; and one with black spots united into a band on both wings (fig. 2 of same plate), £1 1*s.*; while a very fine dark *A. aglaia*, also figured, pl. 61, fig. 5, of same work, reached just £9. A "silvery-white variety" of *Vanessa urticæ* sold for £3, and two with costal blotches broadly confluent realized £2 5*s.* and £2 10*s.* respectively; while a fine black *Limenitis sibylla* brought £1 10*s.*, and one equally fine, but with the band not completely obscured on the fore wings, £1. A fine unicolorous *Epinephele ianira* made £1 6*s.*; "a fine white variety" of *Satyrus semele*, £3 3*s.*; a fine dark male and one very pale, £2 5*s.* the two; and two lots of three each of *E. hyperanthes*, in which one had large streaked ocelli, and the other two were var. *arcte*, £2 and £1 15*s.* per lot. Among the "blues" the more remarkable forms were a leaden-coloured male *Lycæna adonis*, which brought £2 12*s.* 6*d.*, and under side aberrations of the same species, of which one with the ground colour white sold for £2; one with broad black streaks on fore wing, and an almost spotless male, £2 2*s.* the two. Ten specimens of *Chrysophanus dispar*, put up singly, realized from £3 7*s.* 6*d.* to £1 10*s.* each; and five specimens of *Lycæna acis*, sold in two lots, brought an average of just over 9*s.* per specimen; the total realized for the butterflies being within a few shillings of £160.

Among the more interesting lots of moths was a series of ten specimens of *Smerinthus tiliæ* (figured in the 'Entomologists' Record,' vol. i. pl. A, and described p. 327), which brought £5 10*s.*, two other series of thirteen each of varied specimens of the same species realizing £2 7*s.* 6*d.* and £4 per lot; a series of six specimens of *Sarrothripus revayana*, which included Curtis's type-specimen of var. *stonanus*, and five var. *ramulanus*, one of the specimens also being Curtis's type, brought £3 the lot; while for four other lots of the same species, varying in number from sixty-six to eighty-three specimens, each containing many distinct forms, and the whole comprising the material for the revision of the species that Mr. Clark had in hand at the time of his death, prices ranging from £1 7*s.* to £1 per lot were obtained.

A fine dark variety of *Sphinx ligustri* sold for £3 10*s.* The four best varieties of *Arctia caia*, put up singly, brought £8 8*s.*, £8 8*s.*, £6, and £4 15*s.* each respectively; and for half a dozen single specimens of *A. villica*, all being good forms, prices of £2 15*s.*, £2 5*s.*, £2 2*s.*, £1 6*s.*, £1 1*s.*, and £1 1*s.* each were obtained. A lot of twenty-two *Spilosoma mendica*, which included "a nearly white male but with costa and cilia of fore wings blackish," and one var. *rustica*, realized £2 2*s.*, and a specimen of *S. menthastri* approaching var. *walkeri* with three others £1 1*s.*, while a somewhat similar lot reached only 10*s.* Three specimens of *Zeuzera æsculi* having the spots large and confluent, each put in a separate lot with others, brought £1 4*s.*, £2, and £3 15*s.*, respectively, per lot; a dark variety of *Dasychira pudibunda*, with others, £2 10*s*.; a male *Saturnia carpini*, "with fulvous hind wings and the markings, except ocellus, obsolete, and a very white female," £1 6*s*. the two; and a lot of five *Phalera bucephala*, including two fine dark specimens, one with and one without silvery lines, and other nice forms, £2 10*s*. Of a long and varied series of *Angerona prunaria* perhaps the most interesting lot was one of three specimens, which included "an orange male, the fore wings shaded with golden," and two others, which sold for £2 15*s*. the lot. A dwarf form of *Rumia cratægata*, with white hind wings, and a specimen of *Venilia maculata* near var. *quadrimaculata*, with three others, made £2 5*s*.; a lot comprising one white, one dark, and two very light forms of *R. cratægata*, £1 10*s*.; and a lot of six *Ematurga atomaria*, consisting of "two unicolorous dark-brown males, three black forms, and a light fulvous male," £1 15*s*.

Two lots of nine and ten specimens of *Nola centonalis* each, with eight *N. albulalis*, realized £1 12*s*. 6*d*. per lot; fine specimens of *Lælia cœnosa* brought round about 17*s*. per pair; *Noctua subrosea* from 10*s*. to 22*s*. per pair; *Xylina conformis*, put up in lots of three, from £1 1*s*. to £1 10*s*. per lot; and *Cleora viduaria*, when in good condition, from 10*s*. to 15*s*. apiece. The total of the two days' sale, which included two 40-drawer cabinets, falling just short of four hundred and ninety pounds.—R. A.

CAPTURES AND FIELD REPORTS.

Malacosoma neustria, L., in Kincardineshire. — During the second week of June, 1909, when staying with my friend the Rev. J. R. Fraser at Kinneff, Kincardineshire, we paid a visit on the 15th to Fawsyde, the residence of T. L. R. Shand, Esq. His gardener, Mr. Wm. Cormack, had four days previously noted on a young single white weeping standard rose an attack which was completely new to him. Two twigs were affected, each showing a firm belt of lepidopterous eggs beneath a short dense web which extended to the nearest young leaves. On the web were numerous small blackish larvæ. The appearance of the attack suggested at once the lackey moth (*M. neustria*, L.) as its author. As the plant was growing in the open, it was of some importance to ascertain whether the eggs had been deposited on it there, *i. e.* whether this was a case of attack by a species already established in the neighbourhood, or if it were simply an accidental introduction. The latter was clearly proved to be the case. The roses had been imported by a firm of nurserymen from Holland about December, 1908. After remaining in their hands three months, the roses were sent to Fawsyde in the middle of March. There was a very apparent demarcation between the young shoot subsequently (March–June) grown and the wood of the previous year. It was on the latter that the eggs had been deposited. This must have taken place in Holland, for *M. neustria* emerges normally in July or August. However, as their identity was by no means certain at first the larvæ were reared, and the following notes were made.

The first moult occurred on June 20th; immediately after the yellowish dorsal line became apparent. A second moult was in progress on June 28th. A third took place on July 9th, and it was noticeable afterwards that the caterpillars seemed more active and less attached to the web. The fourth change was made on July 21st, and a fifth began on August 7th. Up to the fourth change every fresh batch of food had been regularly webbed over, but after it there was a less pronounced tendency to spin. By August 19th spinning up was in full swing. The first pupa was noticed on August 27th, and the last about September 18th. These dates, so much later than usual, made probable hybernation in the pupa. But on October 7th the fluttering of wings drew attention to the breeding-cages, and one or two imagines were seen to have emerged, probably not earlier than the 5th. They continued to hatch out for about a week. The identification of the species was effected before the imagines were bred. As the larval characters became more pronounced, it was evident they must be *M. neustria*, L., or some closely related Continental form. To settle the matter, some nearly full-fed examples, killed extended by plunging into boiling seventy per cent. alcohol, were submitted to Mr. South, who pronounced them to be undoubtedly *M. neustria.*—James Waterston; 9, Woodburn Terrace, Edinburgh.

Ichneumonidæ in London District.—The *Euonymus* bushes so plentiful in front gardens of this (Herne Hill) and other suburban localities appear every year to be a much-favoured food-plant of *Abraxas grossulariata*, and, speaking of this particular place, the duty of keeping within reasonable bounds the larvæ of this moth appear to be undertaken by five species of Ichneumons, viz. *Casinaria vidua*, Grav., *Mesochorus** *fulgurans*, Curt., *M. olerum*, Curt., *M. basalis*, Curt., and a Braconid (*Apanteles*) of as yet doubtful identity, all of which make their cocoons among the branches of the shrub. The commonest parasite of *Grossulariata*—*Stenichneumon trilineatus*, Gmel.—I have not yet found here. Only single specimens are produced of *Casinaria vidua* and *Mesochorus fulgurans* from a caterpillar, but more of the three other and smaller species from one host. Of other Ichneumons met with here, but not traced to their local hosts, are:—*Cratichneumon coruscator*, Linn., and *C. fabricator*, Fab., *Ichneumon suspiciosus*, Wesm., *I. extensorius*, Linn., *Barichneumon albicinctus*, Grav., *Melanichneumon leucomelas*, Gmel., numbers of this circling round a small piece of bank on sunny mornings probably emerged from Noctuæ. *Amblyteles armatorius*, Forst., the males of which were excessively numerous. *Platylabus pedatorius*, Fab., *Glyphicnemis brevis*, Grav., *Phygadeuon variabilis*, Grav., *Hemeteles areator*, Panz., *Atractodes vestalis*, Hal., *Exetastes cinctipes*, Retz., *E. nigripes*, Grav., *Pimpla examinator*, Fab., *P. turionellæ*, Linn., *P. oculatoria*, Fab., *P. alternans*, Grav., *P. detrita*, Holmgr., *P. instigator*, Fab., *P. inanis*, Grav., *P. maculator*, Fab., *Stilbops chrysostoma*, Grav., *Cteniscus succinctus*, Gr., *Bassus læta-*

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* All the species of *Mesochorus* are known to be hyperparasitic, not infrequently upon Braconids, and in this case the *Apanteles* was doubtless the host of at least the smaller species.—C. M.

torius, Fab., *B. sulcator*, Grav., *B. gracilis*, Grav., *B. tricinctus*, Gr., *B. dimidiatus*, Schr., *B. tarsatorius*, Panz., *Alomyia debellator*, Fab., typical form and var. *nigra* (male), *Lissonota bellator*, Gr., *L. sulfurifera*, Gr., *L. cylindrator*, Vill., in September, *Glypta lugubrina*, Hlg., and the ubiquitous *Ophion luteus*, Linn., resorting to the street lamps when lighted. I must also mention the capture on Wimbledon Common of a single female of *Scolobates auriculatus*, Fab., during August last. I am indebted to Mr. Claude Morley, F.Z.S., for kindly identifying the above.—RUPERT STENTON; Herne Hill, December 9th, 1909.

PŒCILOCAMPA POPULI, ab.—On Nov. 29th last, whilst working for moths under a very powerful electric arc lamp outside my office in the New Explosive Works here, I was surprised to see what I at first took to be a late *Pistacina*, but much to my surprise I found it to be a curious aberration of *P. populi*. It was equally as active on the wing as two or three normal specimens which were flying around, although it had the tip of the right fore wing slightly crumpled (this I drew out in the setting). The specimen is of a golden brown colour throughout, except the antennæ, which are of the usual colour. It shows traces of the pale oblique transverse bars of the fore wings, but the pale colour is absent and replaced by the colour as above. During the past three years I have had some hundreds of these moths through my hands, the night men sometimes having as many as four dozen for me in the morning, the result of one night's catching, but never before have I observed one worth recording even as a slight variety. — HERBERT WM. BAKER; 73, Limetree Place, Stowmarket, Suffolk, November 14th, 1909.

PŒCILOCAMPA POPULI AT CHESTER.—I took a fine male specimen off the globe of a Chester electric lamp, where it was resting, at half past eight on the evening of November 19th. The capture is interesting, as the November of this year was exceptionally cold.—J. ARKLE; Chester.

APOROPHYLA AUSTRALIS, Bdo.: A CORRECTION.—I regret to find that, by an oversight, I incorrectly recorded in 'The Entomologist,' vol. xxxviii. p. 93, the capture of a specimen of this insect in Cornwall.—W. A. ROLLASON; "Lamorna," Truro, Cornwall, December 13th, 1909.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, November 3rd*, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair. — Mr. C. Turner Clark, F.Z.S., of 90, The Mall, Newport, Isle of Wight; Mr. Reginald Leigh Leigh-Clare, c/o Messrs. Allen and Gledhill, Singapore; Mr. Thomas Dobson, of Park Avenue, The Park, Sharples, Bolton; Mr. Frank James Evans, of the Botanical Department, Trinidad, British West Indies; Dr. T. P. Lucas, Wakefield's Buildings, Adelaide Street, Brisbane, Australia; and Dr. Gilbert William Nicholson, M.A., M.D., of the Cancer Hospital, London, S.W., were elected Fellows of the Society.—Mr. C. O. Waterhouse exhibited a living Buprestid beetle of the *Chrysobothris*, found in an orchid-house in the north of London. It was probably Brazilian, but there was nothing quite like it in the Natural History Museum.—Mr. A. E. Gibbs brought for exhibition a case containing a series of *Parnassius apollo* taken by him this year in the Vallée de Joux, Swiss Juras, at 3300 feet, and at Eclépens. He pointed out that the species in the Jura shows a tendency toward the form known as ab. *pseudonomion*, and this is most strongly marked in examples from the lower level at Eclépens.—Mr. W. G. Sheldon showed a series of characteristic butterflies collected by him in June of this year at Herculesbad, South-eastern Hungary. They included examples of *Neptis lucilla*, *N. aceris*, *Melanargia galatea* var. *procida*, *Erebia medusa* var. *psodea*, and *Pararge roxelana* as described by him in the current volume of the 'Entomologist.'—Mr. H. J. Turner exhibited (*a*) two extremely small *Cupido minimus* taken with normal-sized examples near Winchester on June 12th, 1909, the expanse of wings being 15 mm.; (*b*) an example of *Anthrocera achilleæ*, in which the blotches on the fore wings were all fused together, giving at a casual glance the appearance of a small A, captured at Gex, Ain, France, on August 11th, 1909; (*c*) a white aberration, ab. *alba*, of *Rumicia phlæas*, taken at Brasted, Kent, on August 28th; and (*d*) examples of *Heodes virgaureæ* var. *miegii* taken at Zermatt in early August, a form said to be unusual outside Spain. Var. *zermattensis* was the usual form of the female met with.—Mr. G. C. Champion exhibited specimens of *Melanophila acuminata*, De Geer, *Criocephalus ferus*, Muls., and other Coleoptera found on pines near Woking. He called attention to the numerous interesting forms that had been found on pines during recent years, not only in the south of England, but in Scotland also. The Buprestid had probably not been searched for previously at the right season—during the driest time at the end of the summer and early autumn—at a period when few insects are to be found. He stated that he had met with various other Buprestids, both in Spain and in Tropical America (e.g. *Buprestis sanguinea*, F., and *Actenodes chalybeitarsis*, Chevr.), in the dry season or when the trees had been scorched by fire.—Mr. Norman H. Joy showed the following new British Coleoptera: *Epipeda nigricans*, Thoms., *Pityogenes trepanatus*, Nordl., both taken at Blair Atholl, Perthshire, September 1909; *Lathrobium dilutum*, Er., captured at Dalwhinnie, Inverness-shire, September 1909; *Cryptophagus pallidus* var. *argentea*, var. nov., differing from the type form in having silvery pubescence; he also exhibited *Philonthus trossulus*, Nord., from Dalwhinnie; the genitalia of *Gnathoncus nidicola*, Joy, and *G. rotundatus*, Kugel, and of *Anisotoma anglica*, Rye, and *A. cinnamomea*, Er.; and a series of *Sunius lyonessius*, Joy, from the Scilly Isles, pointing out the structural characters by which this species may be distinguished from *S. angustatus*.—Mr. W. J. Lucas exhibited a very fine female example of *Sympetrum fonscolombii*, Selys, exhibited on behalf of Mr. F. W. Edwards, of Cambridge, who took it on September 24th, 1908, at Frensham Ponds, in Surrey. Probably this species is always an immigrant with us, and but few specimens have been recorded.—Professor E. B. Poulton, F.R.S., exhibited three species of *Planema* (Acræinæ) together with mimetic species of *Pseudacræa* (Nymphalinæ) captured on the same day in a small patch of forest near Entebbe by Mr. C. A. Wiggins, F.E.S. The Pseudacræas were of two species, but the sexes of one were entirely different in pattern, mimicking two species of *Planema*.

Wednesday, Nov. 17th, 1909.—Dr. F. A. Dixey, M.A., M.D., President in the chair. Mr. H. Rowland-Brown, one of the Secretaries, announced that the Council had nominated the following Fellows to act as Officers and to serve on the Council of the Society for the Session 1910–11:—President, Dr. Frederick Augustus Dixey, M.A., M.D.; Treasurer, Mr. Albert Hugh Jones; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander James J. Walker, M.A.; Librarian, Mr. George Charles Champion, F.Z.S.; and as other members of the Council, Professor T. Hudson Beare, F.R.S.E., Mr. G. T. Bethune-Baker, F.L.S., Dr. Malcolm Burr, D.Sc., F.L.S., F.Z.S., Mr. H. St. J. Donisthorpe, F.Z.S., Mr. Albert Harrison, F.L.S., F.C.S., Mr. Selwyn Image, M.A., Dr. Karl Jordan, Ph.D., Mr. Hugh Main, B.Sc., Mr. Alfred Sich, Mr. Henry Jerome Turner, Mr. Rowland E. Turner, and Mr. James W. Tutt.—Mr. Gilbert E. Bryant, of The Grove, Esher, Surrey, and Mr. Alfred Tetley, M.A., of Avenue Road, Scarborough, were elected Fellows of the Society.—The decease of Dr. Gustave Kraatz, of Berlin, was announced, and Dr. Karl Jordan gave a short account of the services rendered to entomological science by the deceased gentleman, who was for many years a Fellow of the Society.—Mr. H. Eltringham exhibited a case of butterflies from African localities, to show that the species described as *Acræa aurivillii* is the female of *A. alciope*, and to illustrate the mimetic relations between the *Acræa* and the two species of *Planema*, and a species of *Mimacræa* included in the exhibit.—The Rev. F. D. Morice brought for exhibition a case of Aculeate Hymenoptera, representing many different groups visiting a solitary tree of *Ochrademus baccatus*, Del., in the neighbourhood of Jericho. They showed a remarkable similarity in points of colour, &c., and neither plant nor insects, in most cases, were to be found elsewhere in the region.—Mr. A. H. Jones exhibited a few butterflies collected during last summer at Formia, near Naples, including *Melanargia arge*, probably the most northerly limit of the species. Fine forms of *Hipparchia semele*, *Satyrus statilinus*, *Melitæa parthenie*, and *Lampides bœticus;* also various Lycænidæ, presenting little if any difference from the types found in the Swiss Alps.—Mr. H. J. Turner, an example of *Melitæa didyma* in which the greater portion of the black pigment had more or less failed to develop, captured at Zermatt on August 3rd, 1909; a specimen of *Brenthis euphrosyne*, taken in the same locality on July 31st, the spots composing the submarginal line well developed, and most of them elongated towards the base; a specimen of *Polyommatus damon*, in which there was no trace of the transverse row of eyespots on the under side of the fore wings, the discoidal spot only being present, from near Aigle; and two series of *Melitæa parthenie* with var. ? *varia*, the first taken on the Riffelalp on August 1st, and the second up the Valley of the Zmutt, Zermatt, on July 31st.—Mr. A. Sich, a pair of *Depressaria putridella*, Schiff., bred from larvæ taken last June at Whitstable, Kent, the first British examples having been taken in the larval state by Mr. E. D. Green in 1906; also a pair of *Coleophora chalcogrammella*, Zell., taken last August in Richmond Park, Surrey, this species formerly occurring near Scarborough, but not apparently taken hitherto in Britain further south than Suffolk.—Mr. H. M. Edelsten, a bred series of *Nonagria neurica*, Hb. (*edelsteni*) from Sussex, including two new aberrations for which he suggested the names *rufescens* and *fusca*. He mentioned that, as far as he was aware, these two forms had not been previously noted on the Continent. He showed, also, ova and pupa *in situ*, with photographs by Mr. Hugh Main to illustrate the life-history of the species.—Mr. W. G. Sheldon brought for exhibition a case containing several series of Pieridæ taken by him this year at Herculesbad. He drew attention to those labelled as *Pieris rapæ*, suggesting that some of them might be *P. ergane* or *P. manni*, to which respectively they bear a remarkable resemblance superficially. He also exhibited the two "fireflies," *Luciola mingrelica* from Herculesbad, and *Phausis splendidulus*, male and female, from Hohe Tatra.—Mr. W. J. Lucas exhibited two imagines and a larva of the finest of our Neuroptera, *Osmylus chrysops*; the exhibit was made on account of the larva which was taken by Dr. D. Sharp, F.R.S., near Queen's Bower in the New Forest. It pierces and sucks dry some small animals, but its life-history is not well known.—Dr. G. B. Longstaff showed a teratological specimen of a Carabid beetle from Ceylon (*Omphra*, Latr., sp.). The middle femur of the right side was dilated at the distal end, bearing at its anterior angle two supplementary tibiæ coherent at the base; the rudimentary tarsi were also adherent.—Mr. A. W. Bacot showed two boxes containing pupal cases of *Aglais urticæ* collected by Mr. Hugh Main in one locality. Those taken from the food-plant were yellowish white; those taken from the cage in which the larvæ pupated quite black; thus demonstrating the effect of surroundings upon the pupal coloration. — Dr. T. A. Chapman, M.D., F.Z.S., read a paper "On *Callophrys avis*," a Palæarctic butterfly new to Science.

Wednesday, December 1st, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—The Secretary again read out the list of nominations published at the previous meeting.—Mr. W. C. Crawley, of Tollerton Hall, Nottingham, and Mr. G. H. Grosvenor, M.A., of New College and 3, Blackhall Road, Oxford, were elected Fellows of the Society.—The President announced that the Society would hold a Conversazione in the month of May, 1910, and invited the co-operation and assistance of Fellows. —Commander J. J. Walker exhibited one hundred and twenty-eight species of Coleoptera, belonging to sixty-eight genera, which he had taken, by sweeping only, at Wytham Park, Berks, between 12.30 and 3.30 p.m. on November 5th, 1909. Several local and uncommon species were included among these, such as *Homalota puberula*, Sharp, *Anisotoma cinnamomea*, Panz. (both sexes), *A. punctulata*, Gyll., *Hydnobius punctatissimus*, Steph., *Cryptophagus pubescens*, Sturm, *Phlœophilus edwardsi*, Steph., *Mantura matthewsi*, Curt., *Salpingus castaneus*, Panz., *Apion filirostræ*, Kirby, &c.—The Rev. C. R. N. Burrows sent for exhibition examples of an unidentified species of *Luperina* taken during the past season on the Lancashire coast, and discussed by Mr. South in the 'Entomologist,' 1889, p. 271, where he expresses the opinion that it may be a form of *Luperina testacea* intermediate between *L. gueneei* and *L. nickerlii*, and later on (*op. cit.*, 1909). The exhibit also included three specimens of what are taken to be authentic *L. nickerlii*, the first two obtained from a Vienna collection, said to be Nickerl's own collecting, and over fifty years old; the third belonging to Mr. South, and labelled "Bohemia'; a series of undoubted *L. testacea*, mostly labelled from about the same Lancashire district, with four specimens of the doubtful insects, and several specimens of undoubted *L. testacea* of the palest form, taken mostly at Rainham, and named, more for convenience than from conviction, *L. gueneei.* Mr. Burrows pointed out that the form of the fore wings in the Lancashire insect is much narrower than in either *L. testacea* or (reputed) *L. nickerlii*, and said that with respect to the possible connection of these Lancashire specimens with *L. gueneei*, he had consulted what he believed to be Henry Doubleday's original description in the 'Entomologists' Annual,' for 1864, p. 123, but that he was not acquainted with the "*three round white dots* on the costa near the apex," in our common species, and did not see them in the (reputed) *L. nickerlii.*—In the absence of Mr. J. W. Tutt, who was indisposed, Dr. T. A. Chapman opened a disussion on the affinities of *Agriades thetis* (*bellargus*) and *A. coridon*, and exhibited a number of photographs upon the screen to illustrate his views, being details of species included in the Plebiid group. These included slides of the ova of *thetis* and *coridon* by Mr. F. Noad Clark and Mr. A. E. Tonge, and of the first instar of larvæ of *P. argus*, L., *P. argyrognomon*, *A. coridon*, and *A. thetis*; a photograph of the larvæ of *A. thetis*, by Mr. Hugh Main, showing the "fan" structures remarkably well; also many slides illustrating the differences in the genital armature of the two species under review, and their allies.—The Rev. G. Wheeler, Mr. G. Bethune-Baker, and other Fellows continued the discussion, which was eventually adjourned until the February meeting.—Mr. C. P. Pickett, Mr. A. E. Gibbs, Mr. J. W. Tutt, and Dr. Chapman, also submitted series of *A. coridon* and *A. thetis* with varietal forms and aberrations. —Mr. T. Bainbrigge Fletcher, R.N., communicated a paper "On the genus *Deuterocopus*, Zeller."—Mr. H. St. J. Donisthorpe, F.Z.S., communicated a paper on "Some Experiments with Ants' Nests."—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Oct. 28th*, 1909.—The President in the chair.—Mr. Percy Bright, of Bournemouth, and Mr. G. Bowen, B.A., of Kingston-on-Thames, were elected members.—Mr. Tonge exhibited living larvæ of *Pharetra rumicis* from Hatfield, feeding on sallow.—Mr. South, a series of *Hylophila prasinana*, bred, from Scarborough, in some of which a brilliant red markings had developed. — Mr. West (Greenwich), specimens of the Homopteron, *Idiocerus aurentulus*, from Blackheath. It had only once before been taken in Britain.—Mr. Newman, series of *Agrotis cinerea* from Kent, Lewes, and Brighton; the Sussex races were much the smaller. – Mr. R. Adkin, a female of *Ocneria dispar* taken at rest on an elm-trunk at Eastbourne, and read notes on the unusual occurrence. He also showed a series of *Scopula decrepitalis* taken near Rannoch in June last. — Mr. Buckstone mentioned the finding of *Noctua xanthographa*, male, and *Luperina testacea*, female, *in cop.*, on Sept. 27th. — Mr. Edwards, a number of Cicadidæ from South America. — Mr. Sich, for Mr. Green, the new British species recently recorded, *Depressaria putridella*. — Mr. Step communicated the Report of the Field Meeting held at Oxshott on Oct. 9th. — Mr. R. Adkin read a Report of the Meeting of the Delegates of Societies affiliated to the British Association.—Mr. Andrews read a paper on "Diptera."

Nov. 11th.—The President in the chair.—Mr. Ashdown exhibited examples of the species of Lepidoptera taken by him during July in Switzerland, including *Euvanessa antiopa*, *Loweia alciphron* var. *gordius*, *L. dorilis* var. *montana*, *Polyommatus meleager*, *P. icarus* ab. *icarinus*, *Papilio podalirius*, *Syntomis phegea*, *Anthrocera ephialtes*, &c.—Mr. West (Greenwich), the very rare Homopteron, *Ulopa trivia*, from Chipstead; and *Limotettix stactogala* from Deal, on tamarisk.—Mr. Barret, male and female bred specimens of Lepidoptera from Messina, and specimens of *Nonagria arundineta* and its allies.—Dr. Chapman, a living bred example of *Agriades thetis* (*bellargus*).—Mr. Tonge exhibited a fine bred series of *Aplecta herbida*, and also some capital photographs of Lepidoptera at rest.—Mr. Andrews, British Syrphidæ showing how the general appearance of the insects is "broken up" by the darkened portion of the wings and the light area at the base of the abdomen.—Mr. Kaye, series of *Spilosoma menthastri* illustrative of local races, and including some aberrant forms.—Dr. Hodgson, specimens of *Agriades corydon* with white submarginal wedges and partial absence of spots on the under side of the hind wings, and also examples of *A. thetis* (*bellargus*) without discoidals. — Mr. Newman, nearly full-fed larvæ of *Pyrameis atalanta* from ova laid in August.—Lantern-slides were exhibited, among others, by Mr. Main, life-history of *Chrysopa* and *Eristalis*; Mr. Adkin, life-history of *Nola albulalis*; Mr. Tonge, insects in resting positions.

November 25th.—Annual Exhibition of Varieties.—The President in the chair.—Nearly a hundred members and friends were present, about forty of whom brought exhibits.—Mr. R. Adkin exhibited a long series of *Amphidasys betularia* and var. *doubledayaria* reared from ova obtained from a pair taken *in cop.* at Lewisham, male the var., female darkly speckled, and read notes on the brood. He also showed an *Abraxas grossulariata*, fore wings practically all black to beyond the yellow line, with the yellow line almost absent, and a rich specimen of var. *lacticolor*.—Mr. South, aberrations of *Polyommatus* (*Lycæna*) *icarus* (female), Chipstead and Oxted, and commented on the forms. He also showed *Luperina testacea* and var. *nickerlii*, and commented on the two forms and their genitalia; *Melitæa aurinia* from Ireland and the western side of England; *Epinephele jurtina*, showing variation in apical spot, amount of fulvous colour, and in the tone of fulvous in female; also the male type of *Luperina gueneei* var. *baxteri*.—Mr. W. J. Kaye, a remarkable series of the South American *Heliconius dorus*, including a number of the named forms and races, and commented on its geographical range and dimorphism.—Mr. H.

Moore, a series of under sides of the widely distributed *Melanitis leda* of both the wet and dry seasonal forms.—Mr. T. W. Hall, varieties of *Agriades thetis* (*bellargus*), including a male under side, left lower wing almost devoid of spots, and the right normal.—Mr. A. E. Gibbs, fine series of the same species, including ab. *puncta* and ab. *ceronus* (female) from the Swiss Jura, and a series of *A. corydon* with ab. *syngrapha* (female) from Wiltshire, and large very light males from Caux.—Mr. H. J. Turner, *Rumicia phlæas* ab. *alba* from Brasted; minute specimens of *Cupido minimus* from Winchester and Aigle; a male *Polyommatus damon*, with fore wing under side devoid of eyespots, from Aigle; *Lycæna arion* var. *obscura* from Zermatt; *Chrysophanus virgaureæ* var. *miegii* and var. *zermattensis* from Zermatt; *Melitæa aurinia* var. *merope* from the Riffelalp; a series of *Anthrocera carniolica* and var. *hedysari* from Gex; a confluent *A. achilleæ* from Gex, &c.—Mr. Leeds, a *Pieris brassicæ* with under side of hind wings of a very distinct blue, and a dusky variety of *Saturnia carpini.*—Mr. Newman, long and varied series of the various species obtained in the Shetlands, including a series of *Noctua conflua* bred in S. England from northern ova, which were decidedly not of the northern type. He also showed a *Leucania*, which had been named in turn *pallens*, *favicolor*, and *straminea*; the genital indications were indefinite.—Mr. Grosvenor, long series of the forms of *Cænonympha typhon* from its various British lcoalities.—Messrs. Harrison and Main, series of *Boarmia gemmaria* bred and captured, and of *Melitæa aurinia* from N. Wales, both showing much variation, some of the latter resembling the Kentish form.—Mr. Harrison, for Mr. March, a *Pararge megæra* with large and much emphasised ocelli on the under side, especially on the fore wings.—Mr. Hemming, a striated form of *Polyommatus icarus* under side; a partially gynandromorphous *Euchloë cardamines*; melanic aberrations of several Argynnids; and *P. icarus* of the colour of *A. thetis* (*bellargus*), &c.—Mr. Percy Bright, many of the magnificent and unique varieties of British Lepidoptera recently acquired from the collections of the late J. A. Clark, including *Brenthis euphrosyne* with white ground; *Melitæa athalia* with white ground; *Rumicia phlæas* with extraordinary rayed under side; *Aglais urticæ* with white ground; black var. of *Limenitis sibylla*; gynandrous *Celastrina argiolus* and *Polyommatus icarus*; *Anthrocera filipendulæ* with five wings; *Nemeophila russula* devoid of markings on hind wings; nearly unicolorous *Venilia maculata* and *Saturnia carpini*, a unique, strongly melanic specimen captured by J. A. Clark, and two gynandromorphs, &c.—Mr. Buckstone, dwarf specimens of *Melanargia galatea*, *E. jurtina*, *Pieris rapæ*, *P. napi*, and *Spilosoma fuliginosa*; *R. phlæas* var. *schmidtii*, *Bithys quercûs* var. *bella*, yellow ab. of *Arctia caia*, *Aphantopus hyperanthus* ab. *cæca*, &c.—Mr. W. West, of Greenwich, exhibited the Society's collection of Anthribidæ and Curculionidæ, which he had recently rearranged.—Mr. Tonge, numerous stereographs of Lepidoptera at rest.—Mr. Edelsten, a bred series of *Nonagria neurica* (*edelsteni*) with ab. *rufescens* and ab. *fusca*, and ova and pupa *in sitû.*—Mr. St. Aubyn, a *Melanippe sociata* with the band on the fore wing completely severed.—Dr. Hodgson, a long series of many forms of *Cænonympha typhon*, and a specimen of *Pieris rapæ* with a blackish spot in the distal area of the hind wing.—Mr. Edwards, specimens of *Caligo atreus* and *C. beltras* from South America.—Mr. Gadge, *Spilosoma lubricipeda*, with dashes in place of spots; a *Melanippe fluctuata* with whole of central area light gray; an *Agrotis exclamationis* which has a very long claw to the left hind leg; a series of *Porthesia chrysorrhœa* with aberrant spotting.—Dr. Chapman, *Callophrys avis*, with specimens of *C. rubi* var. *fervida* and *Thestor ballus* for comparison, and some fine Spanish *Agriades corydon*.—Mr. E. Sharp, a specimen of *Leucania l-album* taken on ivy bloom at Eastbourne on October 14th; bred *Nonagria neurica*, and a nice series of forms of *Dianthœcia carpophaga*.—Mr. Barnett, a confluent pink form of *Anthrocera trifolii ; Strenia clathrata* with asymmetrical markings, a very light specimen, owing to irregular suppression of transverse lines.—Mr. Payne, a melanic example of *Argynnis aglaia*, and a specimen of *Agriades corydon* var. *syngrapha*.—Mr. E. Bedwell, specimens of *Odontoscœlis dorsalis*, a species of Hemiptera new to the British fauna, from Lowestoft; the rare *Anchomenes gracilipes*; and two specimens of the myrmecophilous beetle *Hetarius ferrugineum*, not taken since 1853 till this year.—Mr. Baumann, bred *Polia chi* var. *olivacea*; *Gnophos obscurata* var. *mundata*; a very dark, obscurely marked ab. of *Cuspidia megacephala*; and a fine banded *Angerona prunaria*.—Mr. Platt Barrett, a case containing species of butterflies from near Messina, Sicily, including *Euchloë turritis*, *Melanargia iapygia*, *Epinephele jurtina* var. *fortunata*, a very large *Pararge megæra*, the yellow southern *P. egeria*, and large and bright *Hipparchia semele* with British representatives or allies for comparison.—Mr. Andrews, the Diptera *Chorisops tibialis*, light and dark forms; and *Microclingsa polita*, a bronze var. from Darn.—Mr. Lucas, a box containing the commoner species of European *Ascalaphi*; the larva of a *Chrysops*; and a *Pieris napi* (female), in which the apex, two blotches, and inner marginal streak were united.—Mr. Sich, a bred series of the new British *Depressara*, *D. putridella*.—Mr. Tarbat, an extremely aberrant form of *Apamea lutulenta* taken at electric light at Fareham.—Mr. Pickett, his fine series of practically all the known forms of *Angerona prunaria*, the results of some eleven years' crossing and interbreeding; and also a very nice set of *Pieris napi* from various localities, bred and captured.—Mr. Sperring, a long series of *Orrhodia vaccinii*, taken this autumn, containing all the forms hitherto noted in this country.—Mr. Colthrup also exhibited varieties of British Lepidoptera.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The first meeting of the Session 1909–1910 was held at the Royal Institution, Liverpool, on Monday, Oct. 18th, Mr. C. E. Stott, Vice-President, in the chair. — This being the annual exhibition meeting there was a very good attendance, including a number of visitors. — Mr. B. H. Crabtree, F.E.S., Manchester, exhibited Lepidoptera, including the following species: *Tæniocampa incerta*, *T. miniosa*, *T. munda*, and *Pachnobia leucographa*, from Lakeside, Windermere; a varied series of *Odonestis potatoria*, from Berkshire; a series of *Arctia caia*, showing the usual range of minor variation, *Vanessa urticæ* approaching var. *ichnusa*, and *Endromis versicolor*, from Aviemore; *Dianthœcia* *carpophaga*, pale forms, from Brighton; *Acronycta aceris*, from Sandown, Isle of Wight; *Cucullia asteris*, from the London district; and *Phorodesma smaragdaria*, from Essex. — Major Woodforde, of Market Drayton, brought *Zonosoma pendularia* var. *subroseata*, and a new variety of the same species like *subroseata*, but with the pink area ochreous, which he had bred this year for the first time.—Mr. George Arnold, F.E.S., showed a number of species of Hymenoptera, among them being *Crabro aphidum*, *Formica nitidus*, and *F. zenus*, the two last out of nests of *F. rufa* from the New Forest.—Mr. F. N. Pierce, F.E.S., exhibited, on behalf of Mr. T. Baxter, of St. Anne's, the *Luperina*, allied to *L. testacea*. This species, only two specimens of which have been previously taken in Lancashire, both by Mr. Baxter, of St. Anne's, has occurred again this year, about a dozen specimens having been captured. Mr. Pierce also exhibited microscope-slides of the genitalia, showing the characters he relied upon for differentiating the new moth from *testacea*. The same member also had *Abraxas grossulariata* var. *flavo-fasciata*, from Wallasey; *Orgyia gonostigma* and *Lycæna argiolus*, from Essex; *Triphæna comes*, from Isle of Eig, and other local species.—Mr. W. Mansbridge, F.E.S., showed a long series of *Boarmia repandata* var. *nigra*, from Knowsley; *Melitæa aurinia*, from Barmouth; and a series of *Eupithecia valerianata*, from Delamere Forest, this being the first record for Cheshire.—Mr. C. E. Raven exhibited a box of Lepidoptera from Rye, Kent, including a varied series of *Mesotype virgata*; *Aplecta nebulosa* var. *robsoni*, from Delamere; and *Gnophos obscuraria* var. *fasciata*, from Folkestone.—Dr. Tinne exhibited a box of Ichneumonidæ.—Mr. H. S. Leigh, of Manchester, a box of Tachinidæ, and contributed notes on the exhibit. — Mr. Robert Tait, Jun., brought two drawers of Lepidoptera, the result of the season's work, which included *Aplecta nebulosa* var. *robsoni*, from Delamere; *Polia chi* var. *olivacea*, from Huddersfield; *Agrotis agathina*, from North Wales; *A. ashworthii*, very light and very dark forms, from North Wales; *Cucullia verbasci*, bred from larvæ found 1907; *Cymatophora ridens*, from New Forest larvæ; *Eupithecia pumilata*, from North Wales; and various species from the South of England, among them *Moma orion*, from Abbott's Wood.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

RECENT LITERATURE.

A Descriptive Catalogue of the Dobree Collection of European Noctuæ. Compiled by HORACE B. BROWNE, M.A. Pp. i.–xv., and 1–156, medium 8vo. Hull and London: A. Brown & Sons, Ltd. 1909. Price 1*s.* net.

THE late Henry Doubleday amassed, in addition to his historical collection of British moths and butterflies, a very comprehensive collection of European Lepidoptera. Both of these are now in the Bethnal Green Museum.

At the present time the interest of many British students of Lepidoptera is extended—chiefly perhaps as regards butterflies—

to that larger field for observation and investigation, the Continent of Europe. So far, however, the moths do not seem to receive very close attention.

The late Nicholas Frank Dobree, who formed his collection of European Noctuidæ between the years 1871 and 1888, may be regarded not only as a pioneer in specialization, but as the first advocate for breaking away from what has been termed the "insular prejudice" of the British entomologist. In gathering together the material for this collection Mr. Dobree obtained chiefly specimens of such species as were found in our islands, or of their allies, from various European countries and from other parts of the Palæarctic region. As an example of this, the first entry in the Catalogue—*Habrosyne* (*Gnophora*) *derasa*, Linn.—may be taken. In the series of this species there are twelve specimens, of which two are from Germany and five from Amurland; the others are British. Justly appreciating the educational value of such a collection, Mr. Dobree (E. M. M. xiv. p. 41) endeavoured to impress upon British students the advantage of a knowledge of the European species and forms when dealing with the lepidopterous productions of their own country.

To-day there is far less difficulty in obtaining natural history specimens from the Continent than was the case during the period covered by Mr. Dobree's activities. Although but few species of Lepidoptera can be claimed as peculiar to Britain, still there are a large number of our forms that should be of interest to entomologists on the Continent.

In addition to the six hundred and fifty-four species, and more than three hundred named varieties in the Dobree collection, there are seven hundred and twenty larvæ which had been preserved by Mr. Dobree. The collection is now in the Museum at Hull, to the Corporation of which city it was formally transferred at the close of 1902, and the Catalogue thereof, which has been so ably prepared by Mr. Browne, is a model of what such catalogues should be. It is quite in accordance with its title, and is up-to-date in the matter of nomenclature. An alphabetical index to the species greatly facilitates reference to the Catalogue, and also to the collection, especially when one wishes to learn the position of any particular species in either.

Transactions of the South-Eastern Union of Societies for 1909. Pp. i.–lxviii. and 1–69. Plates i.–xxv.

Among other excellent papers on organic and inorganic Nature there is one of special interest to the entomologist. This is by Mr. A. Sich, F.E.S., and is entitled "Lepidopterous Leaf-miners" (pp. xlviii. and 30–37). It is illustrated by a plate showing life-history details of *Nepticula acetosæ*. Plate i., forming the frontispiece of the volume, is a reproduction of a photograph of the members of the Congress of the South-Eastern Union of Scientific Societies, taken at Wolvesey, June, 1909. Among the numerous portraits in the group we recognize those of several Fellows of the Entomological Society and Members of the South London Entomological and Natural History Society.

The Agricultural Journal of India. Pp. 408. Calcutta and London: Thacker & Co. Vol. iv. 1909.

Among the contents is a most interesting article entitled "Eri or Castor Silk," by H. Maxwell-Lefroy, the Imperial Entomologist; this is accompanied by ten fine coloured plates showing larvæ and both sexes of the Eri Silk Moth (*Attacus ricini*); there are also six plates of reproductions of photographs illustrating methods of rearing the larvæ; the interior and exterior of the house in which the rearing is conducted; and spinning. An article on the cultivation of shellac as an agricultural product, by the above-named author, is included in part iii. (July, 1909) of the same volume; this also is liberally illustrated.

Proceedings of the Hawaiian Entomological Society for August, 1908–June, 1909. With two plates and three text-figures. Honolulu, Hawaii.

This constitutes No. 2 of volume ii. of the Proceedings, and was published in September, 1909.

Among the various items, all of which are of interest, the following papers may be mentioned:—"Generic Synopsis of Hawaiian Macro-Lepidoptera," by Otto H. Swezey; "A Revision of the Hemipterous Family Nabidæ found in the Hawaiian Islands," by G. W. Kirkaldy (with plate); and "A Conspectus of the Fulgoridæ of the Hawaiian Hemiptera," by G. W. Kirkaldy.

The Thorax of Insects and the Articulation of the Wings. By Robert Evans Snodgrass. No. 1687. From the Proceedings of the United States National Museum, vol. xxxvi. pp. 511–595, with plates 40–69. Published June 18th, 1909.

The author endeavours to show the unity of thoracic structure that prevails throughout all orders of insects.

OBITUARY.

We regret to announce the death, on December 21st last, of The Rev. Henry Charles Lang, M.D., Vicar of All Saints, Southend.

Having studied at King's College, London, he obtained his M.R.C.S. in 1873; three years later L.R.C.P., and L.S.A., and in 1877 the Brussels degree of M.D. Subsequently, however, he entered Holy Orders, being ordained deacon in 1885, and priest in 1886. After holding curacies at Reading, Plymouth, and elsewhere, he was, in 1892, nominated to the vicarage of All Saints.

To entomologists Dr. Lang was well known as an authority on the Butterflies of Europe, and he published a work, in two volumes, upon this subject (1881–84). In June, 1899, he commenced a series of articles, with illustrations, entitled "Butterflies of the Palæarctic Region," in 'Science Gossip' (New Series). These were continued monthly until publication of that journal ceased in 1902. Dr. Lang was elected a Fellow of the Entomological Society of London in 1900.

THE ENTOMOLOGIST

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IN THE FRENCH JURA.

By A. E. Gibbs, F.L.S.

The Department of the Jura possesses many charms. It is a land of mountain and valley, of rushing torrents and picturesque gorges, of vineyards and woodlands, of heaths and meadows. It is studded with old-world villages and delightful little towns which contain many ancient buildings, and boast a history of which they are justly proud. Although so easily accessible it is not often visited by English people, who, for the most part, are content with a passing glimpse of such of its beauties as can be seen from the windows of the railway train as they pass through the northern part of it when travelling to Switzerland by way of Pontarlier. The Jura Mountains consist of a number of parallel chains, running roughly from north-east to south-west. They are composed of limestone, and geological students are familiar with the fact that they give the name Jurassic to an important series of beds of the Mesozoic period. These chains of mountains form the retaining walls, so to speak, of three great plateaux, which are very characteristic features of Jura scenery, and being of different heights, rising one above the other, they present very interesting faunal and floral differences.

On the afternoon of Monday, July 11th, 1909, I alighted from the Pontarlier express at Mouchard, a little place of 800 inhabitants, but of some importance to travellers as being the junction with the line which runs north-eastwards to Besançon, chief town of the Doubs, and south-westwards to Lons-le-Saunier, the capital of the Jura. The country appeared to be inviting from an entomological point of view. Walking through the village towards the forest I found a likely-looking grassy spot by the side of the railway, but it only yielded a few *Melanargia galatea*, *Polyommatus astrarche*, *Epinephele jurtina*, and one *Cœnonympha arcania*, not a very promising start. In the forest one or two *Brenthis dia* were flying. The heavens were overcast, and although I spent the remainder of the working-day exploring the neighbourhood, nothing more was to be got except one or two specimens of *Leptosia sinapis*. The next morning looked a little more hopeful, and I started in good time to work among the vine-clad hills on the north of the railway. Here *Pieris rapæ*, *Hipparchia semele*, *Issoria lathonia*, *B. dia*, and *L. sinapis* were met with. A large clump of the hemp-agrimony (*Eupatorium cannabinum*) in the hedgerow proved a bait for *Thecla spini*, of which a short series was obtained; but the insect was getting past its best, and required careful selection. Away across the valley, on a wooded hill-top, were to be seen the ruins of a castle, and I determined to make for them. In the low-lying meadows which bordered the high road a single specimen of *Everes argiades* was taken, the other Lycænids noted being *Polyommatus astrarche* and *Cupido minimus*. In the village of Pagnoz a lane was found which led up the hill-side in the direction of the ruins, which I subsequently discovered to be those of the old château of Vaulgrenans. When nearing the top of the hill a fine male *Apatura iris* settled on the footpath, but he was too quick for me. A stern chase down the steep pathway left me the victor, and I am able to record the capture of the only specimen of the genus I took during my summer holiday. The next butterfly secured was an insect which puzzled me when I boxed it, but it turned out to be a worn male *Polyommatus icarus* with a decided approach to *bellargus* coloration. I suppose it would be var. *clara*, Tutt, of which I got a brighter and better example at Poligny a few days later. Among the females of this species, taken at Mouchard, is one in which the lower spots of the central row on the under sides of the fore wings coalesce, and form a streak running towards the anal angle. *Aphantopus hyperanthus* was rather abundant, ab. *vidua* being not uncommon. The key of the castle grounds is kept at a farmhouse some distance below the ruins, and the girl who acted as custodian found on arrival at the gate that the lock had been changed and her key would not fit, so I had to wait while she returned to the house. When she came back she explained that she could not find the missing key, but she quickly solved the difficulty by pulling up the fence. In the grassy enclosure at the foot of the keep quite a little collection of species was to be found. *Acontia luctuosa* was in company with *P. icarus*, *C. arcania*, *C. pamphilus*, *E. jurtina*, *Thymelicus lineola*, *Pamphila sylvanus*, and, most common of all, *Melanargia galatea*. The morning's catch also included *Aglais urticæ* and *Vanessa io*, while *Argynnis adippe* was seen. A walk in the afternoon along a road which led to the forest in a more westerly direction yielded no fresh species. Zygænids taken near Mouchard were *Z. achillæ*, *Z. transalpina*, and *Z. pilosellæ*.

Poligny is an ancient little town lying at the entrance to one of the picturesque eroded valleys so frequently found in the Jura. Dominating the town is a lofty wooded hill surmounted by a huge cross and the rather steep declivity formed a very good hunting ground. By the side of the path which led to the summit *Melitæa athalia* and a few *M. parthenie* were sporting, and a larger insect, which proved to be *Satyrus hermione*, was flying among the rocks in a quite inaccessible spot, but after the exercise of a little patience it ultimately came within reach of the net. A couple of *Thecla spini* next fell victims. In a bushy place on the summit *A. hyperanthus* was much in evidence, and a nice ab. *cæca* and one or two ab. *vidua* were added to the morning's bag. A variety of this insect was caught here, which was curiously marked beneath, the one side being spotted as in the type, while the other side was ab. *vidua*, that is to say, it had three ocellated spots on the left fore wing and only two on the right. Strange to say, I took a similar specimen the next day at Lons. Two *Cœnonympha iphis* were also secured, and a few bright specimens of *C. arcania* were selected from the numbers which were flying on all sides. After an hour's ramble on the plateau, which yielded only common species, a very rough and precipitous track led me down to the pretty little village of Vaux, a mile or two from Poligny. In the afternoon the slopes on the west side of the valley were visited. The early morning had been bright, but towards noon the sky clouded over, and little was to be got after lunch. On a patch of greensward just above the vineyards a single male specimen of *P. hylas* was flying with the more numerous *P. icarus* and *C. minimus*; other butterflies seen during the ramble being *P. napi*, *P. rapæ*, *L. sinapis*, *V. io*, *P. atalanta*, *A. urticæ*, *P. c-album*, *M. athalia*, *A. hyperanthus*, *C. pamphilus*, *E. jurtina*, and *P. sylvanus*.

In the evening I went on to Lons-le-Saunier, where I hoped to find some interesting insects, but on the morning of the 15th the meteorological conditions were far from satisfactory. Nothing was flying in the park, nor was anything to be seen on the banks of the little river Vallière until a sawmill was reached, where, flying by the wayside, I took a couple of specimens of *Everes argiades*. Leaving the water meadows and seeking higher ground I crossed the road and tramway track and found a path which led to the village of Perrigny, where on a railway bank with a sunny aspect I captured *Argynnis aglaia*, *M. athalia* and *P. icarus*, one large male of the latter species measuring 34 mm. in expanse.

Friday, July 16th, was spent at Champagnole, a pleasant town on the second plateau, at an altitude of 545 metres. The day was bright but very windy, and it was not until a steep bank by the side of the river was discovered, where shelter was obtained from the breeze, that any butterflies were found. But in this sunny spot they appeared to be all crowded together. *Brenthis ino*, *B. dia*, *I. lathonia*, *M. dictynna*, *M. athalia*, and *A. adippe*, among the fritillaries; *P. hylas*, *P. icarus*, and *P. astrarche*, among the "blues"; and *C. arcania*, *C. iphis*, *C. pamphilus*, and *A. hyperanthus*, among the Satyrids, were taken. In the afternoon a hillside near the Pontarlier road, which looked promising, was visited, but the wind was too strong for any self-respecting insect to venture on flight, and consequently the walk, so far as butterflies were concerned, proved a failure.

Although the few days spent in the French Jura did not result in the acquisition of a great many specimens, the visit was a most enjoyable one, and I returned to Switzerland with the impression that, given better weather than we experienced in this most depressing summer, the district would prove a happy hunting ground for the entomologist. The following is a list of the species captured or seen :—

Pamphila sylvanus.—Mouchard, July 13th; Poligny, July 14th; Lons-le-Saunier, July 15th; Champagnole, July 16th.

Thymelicus lineola.—Mouchard, July 13th; Lons, July 15th.

T. thaumas.—Champagnole, July 16th.

Cupido minimus.—Mouchard, July 13th; Poligny, July 14th; Champagnole, July 16th.

Nomiades semiargus.—Lons, July 15th.

Polyommatus hylas.—Poligny, July 14th; Champagnole, July 16th.

P. icarus.—Mouchard, July 12th, 13th; Poligny, July 14th; Lons, July 15th; Champagnole, July 16th.

P. astrarche.—Champagnole, July 16th.

Everes argiades.—Mouchard, July 13th; Lons, July 15th.

Thecla ilicis.—Poligny, July 14th.

T. spini.—Mouchard, July 13th; Poligny, July 14th.

Aporia cratægi.—Poligny, July 14th; Champagnole, July 16th.

Pieris rapæ.—Mouchard, July 13th; Poligny, July 14th; Lons, July 15th; Champagnole, July 16th.

P. napi.—Poligny, July 14th; Lons, July 15th.

Leptosia sinapis.—Mouchard, July 12th, 13th; Lons, July 15th; Champagnole, July 16th.

Argynnis aglaia.—Lons, July 15th.

A. adippe.—Mouchard, July 13th; Champagnole, July 16th.

Issoria lathonia.—Mouchard, July 13th; Champagnole, July 16th.

Brenthis ino.—Champagnole, July 16th.

B. dia.—Mouchard, July 12th, 13th; Champagnole, July 16th.

Melitæa parthenie.—Poligny, July 14th.

M. athalia.—Poligny, July 14th; Champagnole, July 16th.

M. dictynna.—Champagnole, July 16th.

Vanessa io.—Mouchard, July 13th; Poligny, July 14th.

Pyrameis atalanta.—Poligny, July 14th; Champagnole, July 16th.

Aglais urticæ.—Mouchard, July 13th; Lons, July 15th.

Polygonia c-album.—Lons, July 15th.

Apatura iris.—Mouchard, July 13th.

Pararge mæra.—Poligny, July 14th.

Satyrus hermione.—Poligny, July 14th.

Hipparchia semele.—Mouchard, July 13th.

Epinephele jurtina.—Mouchard, July 12th, 13th; Poligny, July 14th; Champagnole, July 16th.

Aphantopus hyperanthus.—Mouchard, July 13th; Poligny, July 14th; Lons, July 15th. Ab. *cæca*—Poligny, July 14th. Ab. *vidua.*—Mouchard, July 13th; Poligny, July 14th.

Cœnonympha iphis.—Poligny, July 14th; Champagnole, July 16th.

C. arcania.—Mouchard, July 12th, 13th; Poligny, July 14th; Champagnole, July 16th.

C. pamphilus.—Mouchard, July 13th; Poligny, July 14th; Lons, July 15th; Champagnole, July 16th.

Melanargia galatea.—Mouchard, July 12th, 13th; Champagnole, July 16th.

A FEW ICHNEUMONS TAKEN IN CORNWALL, 1909.

By W. A. Rollason, F.E.S.

The weather for the year has been on the whole cold, wet, windy, and unsettled, and generally speaking unfavourable for entomology. I have, however, taken a fair number of insects, a list of which may be of interest. All the specimens have been determined by Mr. Claude Morley, F.E.S., F.Z.S., to whom I tender most grateful thanks for the valuable assistance so generously given. Of the returns sent me to date I have to record forty-six species as follows:—

Eighteen Species New to Cornwall.

Cœlichneumon cyaniventris, Wesm. — Three males, near Truro, August.

C. derasus, Wesm.—Two males, near Truro, August.

Stenichneumon trilineatus, Gmel.—One female, Malpas, May.

Cratichneumon dissimilis, Grav. — Two males, near Truro and Devoran, August.

Microcryptus abdominator, Grav.—Six males, Callestock, June; Malpas, July.

Acanthocrypus quadrispinosus, Grav.—One female, Truro, October.

Idiolispa analis, Grav.—Two females, Perranporth, July; Penweathers, August.

Pimpla robusta, Morl.—Two males, Calenick, August.

P. brunea, Brisch.—Two males, near Falmouth, September.

P. inanis, Scop.—One male, Calenick, August.

Glypta lugubrina, Holmgr.—One female, Penweathers, August.

Stilbops chrysostoma, Grav.—One male, Nansavallan Wood, May.

Exetastes cinctipes, Retz.—Truro district and Port Isaac, July and August, numerous.

Bassus tarsatorius, Panz.—One male, Malpas, July.

Megastylus borealis, Holmgr.—One male, Calenick, May.

Exochilum circumflexum, Linn.—One, Truro, August.

Microdus tumidus, Nees.—One male, Malpas, May; two females, Calenick, May.

Proctotrypes gravidator, Linn. — One female, Truro, October. This insect sharply stung my little daughter, causing a raised white lump, a quarter of an inch in diameter, which remained for about four hours.

The following list of twenty-eight species gives my further captures, which species, although having been previously recorded, have not in some instances been reported with data for many years:—

Protichneumon fuscipennis, Wesm. — One female, Perranporth, August.

Cœlichneumon consimilis, Wesm.—Two females, Callestock, June; Perranporth, July.

Melanichneumon saturatorius, Linn.—Two males, Truro, July and August.

Barichneumon vestigator, Wesm.—One male, Pencalenick, August.

B. albicinctus, Grav.—One male, Penweathers, July.

Ichneumon latrator, Fab.—Five males, Penweathers, August.

I. sarcitorius, Linn.—One male, Truro, July.

I. extensorius, Linn.—One female, Truro, May.

Amblyteles palliatorius, Grav.—One male and one female, Perranporth, August.

A. oratorius, Fab.—One male, Calenick, May.

Platylabus dimidiatus, Grav.—One male, Perranporth, August.

Phygadeuon dumetorum, Grav. — One male, Falmouth district, September.

P. rugulosus, Grav.—Two males, Malpas, May; Calenick, June.

P. variabilis, Grav.—One male, Calenick, May.

Glyphicnemis profligator, Fab.—One female, Penweathers, July.

Cryptus torsoleucus, Schr.—One female, Calenick, August.

C. obscurus, Grav. — Malpas, May; Calenick, May and June; Callestock, June, numerous.

Pimpla examinator, Fab. — Two males, Truro and Calenick, August.

P. brevicornis, Grav. — Six males, Calenick and Pencalenick, August; three females, Malpas, May; Perranporth and Penweathers, July.

P. instigator, Fab.—Two males, Calenick and Old Kea, May; two females, Callestock, June; and Truro, September.

P. turionellæ, Linn.—Six males, Calenick, May.

Lissonota cylindrator, Vill.—Three males, Perranporth and Pencalenick, August.

L. sulphurifera, Grav. — Three males, near Truro, September; one female, near Falmouth, September.

L. bellator, Grav.—One male, Truro, August; two females, Penweathers, August; and near Falmouth, September.

Banchus pictus, Fab.—One female, Truro, July.

Exetastes nigripes, Grav.—One female, Calenick, August.

Bassus lætatorius, Fab.—One female, Truro, August.

Ophion luteus, Linn.—One female, Porthtowan, May; one male, Truro, September.

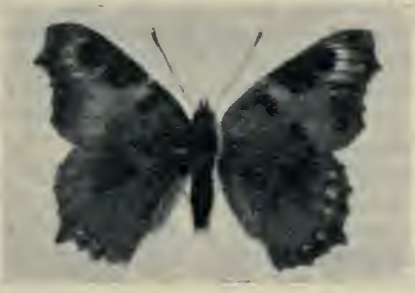
"Lamorna," Truro: December 14th, 1909.

VARIATION IN *VANESSA URTICÆ*, L.: SEASONAL (CLIMATICAL) AND LOCAL VARIATION IN *V. URTICÆ* AND IN *V. IO*, L., BY WHICH THE TWO SPECIES SHOW A TENDENCY TO MEET IN FACIES.

By T. Reuss.

(Concluded from p. 27.)

Now, I believe that an entomologist who has digested some cases of extreme seasonal dimorphism would also find it nourishing to think that *V. urticæ* would be capable of producing, under suitable conditions, an extreme seasonal form which would exhibit a perfect *ocelliform* facies like *V. io.*



V. urticæ ab. *ioformis*, male (*cf.* 'Ent. Record,' pt. iv. 1909).

The pigmentation of the left pair of wings is depicted as it appears *when the specimen is held up against the light.* This shows the brightly transparent white dots at the apex of the fore wing, which are placed in the same way (both on the upper and *under side*, where they are yellowish), and are of the same kind of transparency as similar spots in normal *V. io* (compare also *V. io* ab. *fischeri*, Stdfss., figured vol. xlii. p. 311). In the hind wing the density of the pigmentation and its distribution is very unlike that of *urticæ*, and much more like that of *io*, or abs. of *io*. The right wing pair in the figure shows the aspect of the markings under the usual conditions for comparison. The ground colour of the hind wings is a warm red-brown, as in *io*; the fore wings are orange-brown in colour.

I bred this specimen—which might pass as a hybrid between *urticæ*, female, and *io*, male, just as *V. io* ab. *fischeri*, Stdfss., looks much like a possible hybrid of *io*, female, and *urticæ*, male—from *wild* Continental larvæ. The pupa was exposed to the sun's direct rays, the heat of which like artificial cold or heat is capable of overthrowing hereditary tendencies, and of thus enabling the inherent *io-formity* to develop afterwards under stimulating temperature conditions, *representing exaggerated seasonal influence.* The "mechanism" of such aberrative development seems again to consist in alterations of the blood, and blood pressure, regulating the diffusion of the pigment in the wings, of a kind evidently for which *V. urticæ* is *predisposed* (*inherent io-formity*). Prof. Stéphane Léduc, Nantes, has shown that even "non-vital" chemical substances, if allowed to diffuse in a suitable medium, will form beautiful ornamental patterns of different kinds, according to the conditions under which they diffuse.

The facially *io-form* aberrations which develop in a saltatory manner in wild pupæ of *V. urticæ* when they are climatised in tropical conditions or exposed to *contrasts of temperature* offer at least sufficient excuse for that thought. This becomes especially clear when it is remembered that *V. urticæ* actually indulges in a slight degree in seasonal variation, the variety of the hot season often showing the *io-form* tendency. Cold weather brings the facies nearer to the northern local variety *polaris*, while a hot season will produce specimens very like those found in the hot valleys of Spain, and even approaching var. *ichnusa*, Bon., of Corsica and Sardinia (a local heat form), and var. *chinensis*, Leech, of Asia, *both of which latter varieties are io-form*: *ichnusa* by its ground colour, the absence of the two puncta on the fore wings (and in the *hot season* even of the inner marginal blotch), *chinensis* by its large size and all-brown, irrorated under side. Thus it appears that the *facial variation of V. urticæ, induced by seasonal conditions of light and temperature, is in the hot season slightly io-form*, and moreover *tends to cover the amount of facial variation in local groups.**

By a simple experiment every one can easily prove for himself that the facial variation of *urticæ* is bound up with the seasonal amount of light and temperature, and not with any mere time of the year as such, nor necessarily with any particular generation. Let any two broods of *urticæ* develop simultaneously, the one in a warm, sunny room, and the other in a cold, sunless (darkened) room open to the night air; then, in the first case, the resulting imagines will be more or less transitory to the *io-form* var. *ichnusa*, in the second to var. *polaris*,† and very likely there will be one or two beautiful aberrations extra in both groups.

Now, the degree of regular variation in *V. urticæ* is slight as compared with that in *A. levana—prorsa*, but when the behaviour of these latter extreme forms is similarly tested they prove themselves to be just as susceptible to the effects of light and temperature as *V. urticæ*. When July and August belie their reputation for warmth and sunlight, then the summer form var. *prorsa* tends to *drop out entirely*; the pupæ, instead of emerging in August, hybernate and come out in the next spring as typical *levana*;* but in the summer following, if the season is favourable (normal), these will produce var. *prorsa* as usual, though it is not unlikely that (the tendency being at once atavic and protective) a small percentage of the pupæ hybernate even under normal conditions. On the other hand, if the season is exceptionally hot, and also otherwise suitable to the insects, then var. *prorsa* will generate twice, and thus tend to drop *levana*, though this seems to happen rarely, because var. *prorsa* is the progressive form, and is therefore not supported in such a case by hereditary tendencies. If two (perhaps never full) successive broods of *prorsa* are to emerge, *then already the first brood must, in perhaps all its stages*, have been influenced by abnormally stimulating conditions.

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* Local forms tend more or less, besides indulging in facial variation, to become sexually alien from their type; they are often "species in the making." They are first induced by temperature, *according to the local climate*, then they are developed and "fixed" gradually by hereditism under the protection of "local isolation" from the type, which would otherwise invade the district and swamp the varietal tendency before *sexual alienation had time to take place* and prevent this (compare the effects of *regular migratory* habits in butterflies). How necessary a factor for *physiological* divergence "local isolation" is, becomes apparent when it is remembered that nowhere on the mainland of Europe does a fairly constant and distinct variety of *urticæ* exist, while on the Isles of Corsica and Sardinia "insular isolation" has triumphantly produced var. *ichnusa*.

† "On the Effect of Rearing Larvæ of *V. urticæ* in Darkness," Entom. *antea*, 1909, p. 39, recorded by Col. N. Manders. Twenty-one of fifty-five butterflies were var. *polaris*, trans. An exaggeration in the sense of var. *polaris* would bring the facies near *V. milberti* of North America. Even *V. io* sometimes indulges in a black median fascia like that of *V. urticæ* var. *polaris*, trans. I reared several such specimens last season.

The inferences are obvious:—1 (*a*) Facial variation is mostly bound up with the conditions of light and temperature; (*b*) changes in facies, even of the most extreme kind, need not disturb specifical identity.

2. On the other hand, specifical divergence appears to be dependent on an effective isolation of any one group from the type. The facies of the new species—which begins as a local variety (*cf.* the evidence successfully adduced by Prof. Standfuss)—may either remain almost typical, or *may be an exaggeration of one*

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* The following record by Mr. St. Quintin, F.E.S., in the Ent. Rec. pt. ii. 1909, p. 45, adduces excellent evidence of the effect of a cool English season on a brood of *A. levana*. Mr. Quintin writes:—"In July, 1907, I divided with a friend the ova laid in a cage by a Swiss female *A. levana*. When we returned to England my larvæ were kept in an *unheated greenhouse*, and pupated, duly emerging in the spring of last year as the form *levana*. My friend kept his larvæ in a warmer house than I did mine, and they pupated quite a fortnight earlier, and all emerged in September as the form *prorsa*, with the exception of one individual, which passed the winter in the chrysalis, and emerged in the March following as typical *levana*." Indian butterflies adduce conclusive proof that one species may be dimorph—in the extreme sense—in one locality and monomorph in another, dropping one of its forms. Thus, according to the communication of Dr. Seitz (*cf.* Ent. Zeitschr. Stettin, 1893, pp. 290–307), there flies on the Indian mainland *Junonia asterie* among the rich vegetation of the wet season; *asterie* is marked with beautiful "eyes," which are said to represent dewdrops. Later, when the dry season of withered leaves and bare trees comes round, there flies *Junonia asterie* again, but now the fly is dark-veined and without "eyes." It resembles a dry leaf in adaptation to the seasonal conditions, and bears the name *almana*. Off the Indian mainland, now, there lies the *evergreen* Isle of Ceylon, and there *Junonia asterie* flourishes also, *but only as the dewdrop-form*. Again, in adaptation, it has dropped its "dry-leaf form" *almana*.

of the seasonal dresses of the type according to the local climate. Also the facies of an aberration like f. inst. *V. urticæ* ab. *luna* (*cf.* Entom. vol. xlii., p. 223) is no doubt "climatic," and could be thought to appear in an isolated local group as the characteristic feature.

3. An exaggeration of the regular seasonal variation of *V. urticæ* points to *V. milberti* in one direction (var. *polaris*), and to *V. io* in the other (var. *ichnusa, chinensis*).*

4. Though *ocelliformity* in *urticæ* appears to be bound up with the markings and colours peculiar to *V. io*, such *facial io-formity* in *urticæ* could not guarantee also *specifical io-formity*, inasmuch as a particular kind of sexual affinity seems not to be necessarily bound up with any particular kind of facies.† Therefore—in this sense—*io-form* aberrations, local (climatic) and seasonal forms of the present day, need not be otherwise than *facially* transitory to *V. io*, and the same holds good as regards their possible future development.

Quite a different view spreads before us, however, if the significance of facial *io-formity* in *urticæ* is considered in reference to the *past* history of the species. In that case all existing facts induce the acceptance of Prof. Standfuss's theory put forward in his 'Handbook of Palæarctic Butterflies,' that *V. io* branched off from the ancestors of *V. urticæ* under the influence of a climatical rise in temperature.

Prof. Standfuss's reasoning is based on analogies in the life-histories of the two species, on comparison of the male ancillary appendages, and on the fact that by exposing the pupæ of *V. io* to *low temperatures* he was able, in *V. io* ab. *fischeri*, Stdfss., to produce strong facial transition to *V. urticæ*, which, at least in the fore wings, was very great, especially if the local ("climatic" and *seasonal*) form of *V. urticæ* var. *ichnusa* is taken for comparison. *Normal British V. io, induced by the cool, contrastless climate, are more or less transitory in facies to this urticæ-form aberration, ab. fischeri, Stdfss.* On the other hand, *V. urticæ* preserves its facial *io-form* tendency, and exhibits it also in *seasonal variation*, extreme aberrations, for instance, ab. *ioprotoformis*, ab. *ioformis*, and in existing local (climatic) varieties. In this sense *V. io* appears as a palæ-entomological variety of *V. urticæ*, which became a "species" by losing its sexual affinity to the type.

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* If these two already *io-form* varieties were available for temperature experiments in the pupal stage, the results in facial transition to *V. io* might naturally be expected to be more complete than with pupæ of typical *urticæ*.

† It might be supposed that the sexes of a brilliantly-coloured day-flying species are attracted to each other mainly by the sense of sight, when sexual affinity would be dependent on, or be at least much influenced by, a special facies. But *V. io*, which, with its peculiar colour and markings that distinguish it perfectly from every other butterfly-species, offers the best excuse for such a supposition is just one of those Vanessidæ which, being yearly single-brooded —except, perhaps, in Northern Italy—does not pair till *after hybernation* in the spring of the year following its emergence, when, having enjoyed life all the previous summer and autumn since July, it is naturally in a very sad condition *facially*, being often even in rags. *V. urticæ* shares the same habit in its autumn broods, which, emerging as late as October, have less chance than *V. io* to get rid of their beauty before the next spring; but, mostly, *urticæ* also is badly damaged facially at the very time of its life when it must provide anew for the future of the species. With all the other Vanessidæ—which are among our most richly-coloured flies—the case is similar. This perhaps is conclusive proof that the colours and markings of the facies can have little influence on sexual affinity in these butterflies. I even believe that if a female *V. io* were artificially painted white or yellow, she would still be sought out by the males of the species.

In the case of moths it is perhaps well known that the wings of the females may generally be entirely cut off without lessening their marvellous attractive powers for the males or their fertility.

SIZE-VARIATION OF *MELITÆA ATHALIA.*

By Rev. Frank E. Lowe, M.A., F.E.S.

While preparing notes of some of my captures last summer, the January issue of the 'Entomologist' came to hand, in which Mr. Wheeler refers to specimens of *Melitæa athalia* taken by me at Reazzino (*antea*, p. 10). There can be no doubt that he is right in saying that at present "with very few exceptions it seems hopeless to give characteristics for local races of this species, for three reasons," which he enumerates. Against the asserted tendency to a decrease in size *south* of the Alpes, *teste* Rühl and others, he adduces many exceptions from his own experience. To me it appears that this *decrease* in size may be true when you get *well away* from the Alps, perhaps in the plains of which I know nothing, but not in the mountainous districts themselves. For instance, at Orta and in the Val Strona, Iselle and its neighbourhood, *athalia* is often above the average in size and brilliancy of colour as compared with specimens from the Rhone Valley or Caux. In South France again, to my surprise, all specimens which I have taken at Digne or Gavarnie were small of a poor form. But, as Mr. Wheeler says, "in many localities such different forms are found together" that it is difficult often to find anything characteristic of a locality, especially in the matter of size. This may be exemplified from my Reazzino specimens, all of which I did not send to Mr. Wheeler. Some of these are decidedly small (he is right in supposing that they were taken on the same ground as the "*britomartis*"), one female measures only 31 mm., while, as instances in the other direction, some measure 43 mm., and males 40 mm. Again, some of my largest specimens are from Orta, males often reaching an expanse of 41. From the Tyrol, *i.e.*, the Mendel, Brenner, and Trafoi, specimens appear to be uniformly smaller than those from the Swiss mountains.

Again, as analogous with Mr. Wheeler's instances of bright coloration in the lower Misox Valley, last year I took three examples in the Val Maggia which are so fine that on showing them to Mr. Jones, when we met at Digne, he exclaimed, "Why, they are almost as good as *mehadiensis*." These are not only as strongly marked and as brilliant in colouring, especially on the under side, as var. *mehadiensis*, but they are also large. The smallest *race* of *athalia* that I have noticed is a series I took at the beginning of August, 1904, on Monte Bré. Does this indicate a partial second brood? Here we have males and females averaging 33 and 39 mm. respectively. Many from Ecclepens, Bex and Caux run decidedly small, all of which seems to show, for I have not quoted isolated individuals, that the species varies in size equally on both sides of the Alps.

THE FOSSIL CRABRONIDÆ.

By T. D. A. Cockerell.

It is evident that the fossorial wasps are of great antiquity. *Crabro*, with its curiously reduced venation, cannot be regarded as a primitive member of the series, and yet we have positive evidence that it has remained unchanged, save for the development of minor groups, and of course species, since the middle of the Tertiary period at least. The oldest known species come from Baltic amber, of Lower Oligocene age. I have recently (Mitt. Geol.-Pal. Inst. Univ. Königsberg, 1909) described two of these amber species, *C. succinalis*, about 5 mm. long, and *C. tornquisti*, about twice as large. It cannot be said that they present any feature which would be considered remarkable in a living species. From the Miocene shales of Florissant, Colorado, I have described *C.* (*Tracheliodes*) *mortuellus* (Bull. Mus. Comp, Zool., 1906), a species about 7 mm. long, of quite ordinary type. A second Florissant species may be described as follows:—

Crabro longævus, n. sp.

About 10 mm. long, or a little less (head and thorax about 4½, abdomen about 5), robust, black, the tegument of abdomen nearly all destroyed, so that it cannot be determined whether there were pale spots; thorax densely and minutely punctured; abdomen sessile, the first segment convex, the suture between it and the second depressed; wings slightly reddened; venation normal; the following measurements are in microns: length of marginal cell 1649, its depth at middle 425, its truncate end 187; depth of stigma 204; submarginal cell on marginal 816; end of submarginal cell to end of marginal (lower corner of truncation) 850; upper end of basal nervure to base of marginal cell 900; basal nervure on submarginal cell 170, on discoidal 1020; basal nervure meeting transverso-medial, or almost doing so.

Compared with *C. megerlei* (as figured by Kohl) it differs thus:—

(1) Stigma more tapering at both ends; angle formed by stigma and marginal nervure smaller.

(2) Transverse cubital joins marginal cell much nearer middle.

(3) Basal nervure is more remote from stigma, and its upper section is much shorter in proportion to the lower.

(4) Basal nervure almost exactly meets transverso-medial.

In all these particulars the insect agrees excellently with *C. sayi* nov. nom. (*C. sexmaculatus*, Say, 1824, not Olivier, 1791), although in *C. sayi* the stigma is smaller. The reddish wings and the punctate groove crossing the pleura are also as in *C. sayi*. *C. sayi* occurs to-day at Boulder, Colorado.

Hab.—Miocene shales of Florissant, Station 14 (*W. P. Cockerell*).

The genus *Crabro* is very abundant to-day at Florissant. The recent species have been studied by Mr. S. A. Rohwer, who has described six new ones from that locality.

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By Claude Morley, F.Z.S., F.E.S.

(Continued from p. 31.)

54. *Lecanium persicæ*, Geoff.

Dr. Mayr raised *Phænodiscus* (*Encyrtus*) *æneus*, Dalm., from the "Peach Scale" in Austria (Verh. z.-b. Ges. 1875, p. 758). *Coccophagus cognatus*, How. (Revis. 1895, p. 35), *C. lecanii*, Smith (*l. c.* p. 33), and *C. fuscipes*, How. (Report Ent. U. S. Agric. 1881, p. 359) have been bred in America. From the synonymous *L. rosarum*, Voll., Gaulle (Cat. 106 et 99) records *Aphelinus scutellaris*, Dalm., and *Blastothrix sericea*, Dalm. Dalla Torre says Ratzeburg (Ichn. d. Forst. iii. 106) records *Coccobius notatus* from *Coccus rosæ*, which Mr. Newstead regards as belonging here, though it is more likely referable to *Diaspis*, since I see it is bracketed "*Aspidiotus*."

55. *Lecanium inulæ*.*

From a Coccid so named in his Catalogue (p. 102), Gaulle records *Pteromalus hemipterus*, Walk. (Ent. Mag. 1836, p. 196).

56. *Lecanium pruinosum*, Coquil.* 57. *L. quercitronis*, Fitch.*

The omnivorous *Coccophagus lecanii*, Smith, is said by Howard (Revis. 1895, p. 33) to attack these species in Northern America.

58. *Lecanium viride*, Green.*

This species is said (Proc. U. S. Nat. Museum, 1896, p. 633) to be destroyed by *Coccophagus orientalis* in Ceylon.

59. *Lecanium hemisphæricum*, Targ.

Gaulle gives three parasites upon this species: *Aphelinus scutellaris*, Dalm., *Phænodiscus æneus*, Dalm., and *Cerapterocerus pilicornis*, Thoms.

60. *Lecanium robiniarum*, Dougl.*

From this species *Aphelinus scutellaris*, Dalm. (*pulchellatus*, Westw.) is also instanced by Gaulle (Cat. 106).

61. *Lecanium quercus*, Linn.

The host of Ratzeburg's *Eulophus leptoneuros* seems dubious. He says: "I bred seven males and two females from *Coccus quercus* on oak, in company with several *E. pachyneuros*" (Ichn. d. Forst. i. 169; with four females of the latter species, *cf.* i. 167); later he adds that the former was bred "by Hr. Nördlinger from beech-leaf galls. Hr. Wissmann bred it from *Cynips fæcundatrix*" (*l. c.* ii. 170), and (*l.c.* iii. 214) "again from *fæcundatrix*, and then from *eglanteriæ*." Mayr bred (Verh. z.-b. Ges. 1875, p. 706) *Microterys chalcostomus*, Dalm., from this species in Austria. And Gaulle (Cat. pp. 97–99) says *Erycydnus longicornis*, Dalm., and *Chiloneurus elegans*, Dalm., have both emerged from *Lecanium* on oak. Nees (ii. 434) quotes Fonscolombe (Ann. Soc. France, 1832, p. 334) in saying that *Encyrtus scutellaris*, Dalm., emerged "E cocco tinctorio Quercus cocciferæ, Junio," but Gaulle (Cat. 97) gives *Eucomys obscura*, Dalm., as attacking Coccids on *Quercus tinctoria*.

62. *Lecanium eriophorum*.*

Aphycus apicalis, Dalm., is said by Gaulle (Cat. 99) to have been bred from a species, which he designates as above.

63. *Lecanium coryli*, Linn.

Nees says of *Encyrtus scutellaris*, Dalm. [=*E. infidus*, Rossi] (Mon. Pterom. 223): "Habitat in Coccis, præsertim Coryli Avellanæ"; quoted by Curtis (Brit. Ent. fol. 395). *Chiloneurus formosus*, Boh., is recorded from *Coccus coryli* by Thomson (Hym. Scand. iv. 149). Mayr (Verh. z.-b. Ges. 1875, p. 706) also bred *Microterys sylvius*, Dalm., from *Lecanium coryli*, in Austria, and is quoted by Gaulle and Ashmead. From the var. *L. corni*, Bché., Mayr also records (*l. c.* 696) *Aphycus punctipes*, Dalm.

64. *Lecanium piperis*, Green.*

This species is said to be attacked by *Encyrtus flavus*, Howard (Rep. Ent. U. S. Agric. 1881, p. 367).

65. *Saissetia oleæ*, Bern.

Lecanium oleæ is the host of *Tomocera californica*, Comst. (Rep. Ent. U. S. Agric. 1881, p. 368) in America, and of *Apycus lounsburyi*, How. (Ashm. 1900, p. 387) in South Africa.

66. *Saissetia hemisphæricum*, Targ.

Motschulsky has described his *Encyrtus adustipennis* (Bull. Soc. Nat. Moscou, 1863, p. 55) from the synonymous *Lecanium coffææ*, which he evidently thought distinct from *Pseudococcus coffeæ*, since from the latter he also brings forward (Étud. Entom. 1859, pp. 170–78) both *Encyrtus nietneri* and *Chartocerus musciformis*; but all are from Ceylon. *L. coffeæ*, Sign., is attacked by *Cirrospilus coccivorus*, Mots. (Bull. Mosc. 1863, p. 68), *Coccophagus flavescens*, How. (Proc. U. S. Nat. Mus. 1896, p. 634), *C. orientalis* from Ceylon (*l. c.* p. 633), by the Torymid *Marietta leopardina*, Mots. (Bull. Mosc. 1863, p. 52), by *Thoracantha cyanea*, Mots. (Étud. Entom. 1859, p. 172) and by *Cephaleta purpureiventris*, Mots. (*l. c.* p. 173).

67. *Physokermes abietis*, Geoff.

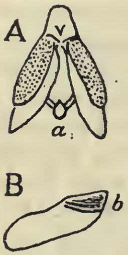
Most of our knowledge respecting the enemies of this species still comes from Ratzeburg, who says (Ichn. d. Forst. iii. 194), among the species bred by Hr. Reissig from *Coccus racemosus* I recently found *Encyrtus cephalotes*; of *E. duplicatus*, Nees (ii. 145), I have actually bred this pretty insect from *Coccus racemosus* several times, and (iii. 188) again from *Coccus racemosus*—all the more striking, therefore, is the anomalous breeding of Hr. Reissig, in which several specimens emerged from a wax-yellow *Syrphus* larva, which had been close to the *Coccus racemosus*; I had already bred a specimen of *E. parasema* (ii. 149) with damaged antennæ in the year 1845 from *C. racemosus*, with *E. mucronatus*; then came a well-preserved specimen from Nördlinger, also from this host; Bouché bred several *E. tenuis* (ii. 149), but only males, from *C. racemosus*—also bred by me from male of this host from Neustadt; *E. testaceipes* (ii. 146) was bred, together with *E. atricollis*, by Hr. Reissig from *C. racemosus*; one male *Eulophus coccorum* (ii. 157) bred from a male pupa of *C. racemosus*; I bred several *Pteromalus racemosi* from my *C. racemosus* (ii. 200, *cf.* i. 201) in August, 1842—in the open in the beginning of August the *Coccus* swellings full of eggs were surrounded by these *Pteromali* (Giraud also bred it from this host, *cf.* Ann. Soc. France, 1877, p. 430); Hr. Reissig bred many *Encyrtus mucronatus* (ii. 148) from *C. racemosus*, with many *testaceus* and *testaceipes*; and again (iii. 193) *E. mucronatus* is the female of *E. parasema*; formerly I received one female of *Pteromalus coccorum* (ii. 197) without abdomen, bred with *Encyrtus æneus* from *Coccus*—later came a male which I consider belongs to it and which I bred from *Chermes piceæ*. Subsequent authors have done little but quote the above observations; but Mayr records (Verh. z.-b. Ges. 1875, pp. 691 et 706) *Encyrtus testaceus*, Ratz., and *Microterys lunatus*, Ratz., from *Coccus racemosus*, Linn., and *M. fuscipennis*, Dalm., from *Lecanium racemosus*, which Ashmead evidently regarded as distinct from

Physokermes abietis, since he gives it under both host-names (1900, p. 391). Giraud (Ann. Soc. France, 1877, p. 433) also bred *Tetrastichus melanopus*, Först.; but that Ratzeburg also raised *Entedon turionum*, Htg., appears doubtful, for, though given under this species in the host-table, only Lepidoptera are specified in the text, of the significant genus *Coccyx*. So abundant are its parasites that fifty per cent. of this species are said to be destroyed in Delamere Forest by *Encyrtus scaurus*, Walk., though Newstead had not met with it elsewhere (Brit. Cocc. i. 31). I suspect *Microterys tessellatus*, Dalm., of preying largely upon it—though not yet bred thence—since it is an abundant species on the spruce trees about Brandon, Suffolk, in May.

(To be continued.)

NOTES AND OBSERVATIONS.

The Tapping of the "Death Watch Beetle."—I never could believe that these beetles struck up their sexual dirge by hammering their heads on the deal boards, and in my collection I find an *Anobium striatum* spread out so as to show a small horny plate, *a*, at the extremity of the body, which I believed, as I still believe, is the plectrum that sounds the monitory music when the beetle takes it into its head to scrape it over a ridge, *b*, at the extremity of the wing-cases. I used to believe *the striæ in the hollow* beyond the ridge, as previously suggested (Westring), were the origin of the sound, but I now recognize *it is the ridge*; the best imitation of the tapping has always been made *with the finger-nail.* When not in use, the horny plate is folded back. In *Anobium tessellatum*, which is larger, these structures are better seen.—A. H. Swinton.



Pupation of Xanthorhoë (Melanippe) fluctuata.—With reference to your note in the 'Entomologist' (vol. xlii. p. 317), perhaps the following may be of interest. On November 29th I obtained from wallflowers in my garden two full-grown larvæ of *M. fluctuata*, one light-coloured with the usual markings, the other dark and slightly larger. These were kept under observation in a small glass jar containing a little earth, the jar being covered with leno. The dark larva spun a cocoon on December 10th, the other on December 11th. On December 23rd the dark larva moved to one side of the cocoon, pupating during the evening; on December 26th the light one pupated in the evening. The pupa at first was light green with a cream abdomen, and has since changed to the normal brown colour. I might add that I tried forcing pupæ of this species last year, but was unsuccessful.—S. W. Gadge; 59, Frankfurt Road, Herne Hill, S.E., January 6th, 1910.

Microscopes and Accessories.—We have received from "Leitz," the well-known opticians, of Wetzlar (also 9–15, Oxford Street, W.), two of their Catalogues—"Microscopes" and "Microscope Accessories." To entomologists the most important of the contents of the former is a new microscope specially designed for their use, of which an illustration appears on the cover of our December number. In the second catalogue, perhaps the most interesting things from an ordinary working entomologist's point of view are the drawing and measuring appliances.

EMERGENCE OF EUSTROMA SILACEATA.—I took a worn female, third week in August, 1909, at Folkestone. She laid about three dozen ova. The larvæ fed up on willow herb (*Epilobium*), pupated, and instead of lying over till May, 1910, the imagines began to come out the second week in October, the last emerging by mid-November. A mating, and some three dozen more ova were obtained. For the larvæ of these there was difficulty in obtaining food supplies, as all but odd bits of *Epilobium* had by this time perished; but with the help of some old-fashioned fuchsia this brood also was got into pupa state. They were put in a north porch, but on December 31st an imago appeared, with another on January 1st, 1910, and others followed on by twos and threes. By January 15th, 1910, I had another forty ova. Larvæ from these began to hatch out on the 20th. I think I shall be able to feed them upon young growths at the base of the small willow herb growing in the garden.—(Rev.) ARCHIBALD DAY; Malvern Link.

PAPILIO NIREUS FOURTEEN MONTHS IN PUPAL STATE.—On September 28th and 29th, 1908, five larvæ of *Papilio nireus* pupated, and one attained the pupal state on October 18th; the other four all went over until August, 1909. On July 24th, 1909, I left Durban by the 'Durham Castle' for England, and three of the butterflies emerged during the passage on August 11th and 12th; the remaining pupa I put in a chip-box, and had it with me all the time I was in London (seven weeks). I returned by the 'Dunluce Castle' on October 9th, and arrived here with the pupa on November 5th. On November 25th, this pupa produced a small female specimen. Thus, all but three days, it has been fourteen months in the pupal state, during which time it has travelled 14,000 miles, and crossed the Equator twice. This is, I think, very unusual, and I cannot account for the butterfly not emerging, at any rate upon either of the occasions when in the Tropics. I may mention that I brought with me twenty-seven pupæ of *P. cenea* that had pupated in July, 1909, and from all of these butterflies emerged on the way home before we got to Teneriffe.—G. F. LEIGH; Durban, Natal.

CAPTURES AND FIELD REPORTS.

LUPERINA GUENEEI AT SOUTHPORT.—It may be of interest to report that I have in my cabinet a specimen of *L. gueneei* from Southport (captured by the late Mr. T. Davies, of Birkdale). It exactly corresponds with fig. 3, pl. vii. (Entom. vol. xlii.). Although somewhat worn, it is easily recognizable, and I have compared it with Mr. Baxter's insects; it most resembles his early captures, having the ochreous tint, and he agrees with me that there is no doubt as to its identity.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

EPIONE APICIARIA IN OCTOBER. — I think the following dates for this species are unusual. I took one on September 13th, 1907, another on October 4th, 1908, and two in 1909 on September 18th and 19th. These are the only specimens of *E. apiciaria* that I have obtained here, although I collect all through the summer over the same ground.—F. W. J. JACKSON; Woodcote End House, Epsom.

EARLY OCCURRENCE OF AGROTIS PUTA.—In 1905 I obtained a female specimen on May 29th, in 1907 a female was found on May 16th, and this year—1909—a male on May 18th. These dates would seem to point to the species being either occasionally or perhaps regularly double-brooded in this locality. — F. W. J. JACKSON.

A RARE BEETLE.—I beg to record the capture of a fine male specimen of *Acanthocinus ædilis*, Linn., in Truro, which was taken about a quarter of a mile from a riverside timber-yard, to which a large quantity of foreign timber is imported, and the probability of its having been imported therewith is confirmed in Fowler's 'Coleoptera of the British Islands." The date of capture was September 28th, 1909. — W. A. ROLLASON; "Lamorna," Truro, Cornwall, January 19th, 1910.

VANESSIDÆ IN CORNWALL.—With reference to recent reports in the 'Entomologist' as to scarcity and otherwise of this family, I have found *atalanta*, *io*, and *urticæ* to have been unusually plentiful in the Truro and Falmouth districts, but *cardui* scarcer than usual.—W. A. ROLLASON; "Lamorna, Truro," Cornwall.

GONEPTERYX RHAMNI IN EARLY JANUARY.—It may be of interest to state that about mid-day on January 10th I saw a male specimen of *Gonepteryx rhamni* on the wing in some meadows near Godalming, Surrey. The butterfly, which was evidently by no means a fresh specimen, was flying rapidly, and the sun was shining almost for the first time since the beginning of the new year.—MISS M. E. FOUNTAINE.

Mr. J. Challenor-Smith writes me that about 12.30 on January 2nd, a bright sunny day, he noticed a specimen of this butterfly on the wing on Silchester Common, Hants.—H. ROWLAND-BROWN.

ICHNEUMONIDÆ IN LONDON DISTRICT.—I am able to supplement the list of Ichneumonidæ met with in this locality—Herne Hill—given in the January number of this Journal, with ten species, kindly identified since its publication by Mr. Claude Morley, F.Z.S. Two of these, *Lissonota deversor*, Gr., and *Bassus graculus*, Panz., of which a male of the former and a female of the latter were taken, appear to have been so far of uncommon occurrence in this country. The remaining eight are *Lissonota variabilis*, Hlg., *Phygadeuon fumator*, Grav., *Perithous varius*, Grav., *Pimpla brevicornis*, Gr., *Bassus biguttatus*, *Prometheous sulcator*, *Exolytus lævigatus*, Grav., *Microcryptus sperator*, Müll. Also, I may mention that the var. *iridipennis* was found with the normal form of *Platylabus pedatorius*, Fab.—RUPERT STENTON; January 6th, 1910.

SOCIETIES.

Entomological Society of London. — The Annual General Meeting was held on Wednesday evening, January 19th, in the rooms of this Society at 11, Chandos Street, Cavendish Square. The following were elected as officers and members of the Council for the Session 1910–11:—President, Dr. F. A. Dixey, M.A., M.D.; Treasurer, Mr. A. H. Jones; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, M.A., R.N., F.L.S.; Librarian, Mr. G. C. Champion, F.Z.S. Other members of the Council:—Professor T. Hudson-Beare, B.Sc., F.R.S.E., Mr. G. T. Bethune-Baker, F.L.S., Dr. M. Burr, D.Sc., F.L.S., Mr. H. St. J. Donisthorpe, F.Z.S., Mr. A. Harrison, F.L.S., F.C.S., Mr. Selwyn Image, M.A., Dr. K. Jordan, Ph.D., Mr. H. Main, B.Sc., Mr. A. Sich, Mr. Henry J. Turner, Mr. Rowland E. Turner, and Mr. J. W. Tutt. — The President, in his Address, after congratulating the Society on its continued prosperity, and paying a tribute to the memory of distinguished entomologists who had died during the past year, referred to the appointment by the Colonial Office of a Committee for Entomological Research, which, he hoped, might be taken as evidence of increased recognition by public authorities of the value of scientific advice and co-operation. The recent Darwin commemoration at Cambridge and the approaching International Congress of Entomology at Brussels were then noticed; and the Address proceeded to deal with the special subject of the plume-scales of the Pierinæ, or "white butterflies." The President advocated the interpretation of these structures as a scent-distributing apparatus, and gave a detailed account of their structure and distribution, pointing out their diagnostic and taxonomic value, and indicating their bearing on questions of bionomic importance. Mr. C. O. Waterhouse and Professor R. Meldola, F.R.S., having proposed a vote of thanks to the President for his Address and his services, which was carried unanimously, Mr. W. E. Sharp, seconded by Mr. Hamilton H. Druce, proposed a similar vote of thanks to the other officers of the Society. This also was carried *nem. con.*, the Treasurer and the Secretaries replying. — H. Rowland-Brown, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society. — *December 9th*, 1909. — Mr. A. Sich, F.E.S., President, in the chair. — Captain Cardew, R.A., of Wimbledon, and Mr. P. A. Tautz, of North Audley Street, W., were elected members.—Mr. Sich exhibited specimens of *Gelechia hermannella* in illustration of his paper. — Mr. Turner, male and female specimens of the rare tailed moth, *Eudæmonia brachyura*, from Sierra Leone. — Mr. Edwards, a box of exotic Hemiptera, among which was the remarkable Heteropteron, *Macrocerœa grandis*, from Tennasserim.—Mr. J. Platt Barrett, pupæ of *Hyles euphorbiæ*, found by him in Sicily, and an immature form of a mole-cricket from Messina.—Dr. Hodgson, the most striking forms of *Anthrocera*, taken or bred by him this year, including dwarf *A. trifolii* and curiously marked examples of *A. hippocrepidis* and *A. filipendulæ*. — Mr. Barnett, dark forms of *Hybernia boreata* and of *Oporabia dilutaria* from West Wickham and Wimbledon respectively. — Mr. Robert Adkin, series of *Agriades corydon*, females, from Eastbourne, showing eight or nine lines of variation. He also showed a bred series of *Polia chi* from Huddersfield ova. — Mr. Sich read a paper entitled "Notes on *Gelechia hermannella*." — Hy. J. Turner, *Hon. Rep. Sec.*

The Manchester Entomological Society.—The first autumn meeting was held in the Manchester Museum, Owens College, on Wednesday, October 6th, 1909, the President, Mr. C. F. Johnson, in the chair. The following exhibits were made:—Mr. R. Tait, Jr., series of *Phibalapteryx tersata*, *P. vitalbata*, *Melanippe procellata*, and *Chærocampa porcellus*, taken at Wilmington, Sussex, in June, 1909; series of *Melanippe hastata*, *Diphthera orion*, and *Cidaria truncata* (the last showing beautiful variation), taken at Abbotswood, Sussex in June, 1909; *Tæniocampa leucographa*, from Lakeside, April, 1909; a series of *Eupithecia pumilata*, taken in July, 1909, at Penmaenmawr; several *Aplecta nebulosa* var. *robsoni*, from Delamere, and a good series of *Agrotis agathina* bred from Welsh larvæ, 1909; *Cymatophora ridens*, bred from New Forest larvæ; *Cucullia verbasci*, from larvæ taken in South Wales in July, 1907; a series of *Agrotis ashworthii*, showing the most extreme light and dark forms, and *Polia chi* var. *olivacea*, from Huddersfield.—Mr. A. E. Wright showed series of the following insects, all taken or bred at St. Anne's-on-Sea in 1908 and 1909:—*Agrotis exclamationis*, *A. præcox*, *A. cursoria*, *A. ripæ*, *A. valligera*, *A. tritici*, *A. segetum*, *Acronycta rumicis*, *Tæniocampa gracilis*, *Leucania littoralis*, *Rusina tenebrosa*, *Dasychira fascelina*, and *Apamea basilinea*; also a living *Dasypolia templi*, taken at light at Burnley.—Mr. B. H. Crabtree, F.E.S., bred series of *Odonestis potatoria*, from larvæ taken this year at Compton, Berkshire, showing considerable variation, and including two very light males from Wisbech; a bred series of *Arctia caia*, from larvæ taken near Altrincham, showing some nice varieties; *Acronycta aceris*, bred, from Sandown (Isle of Wight); light forms of *Dianthœcia carpophaga*, bred, from Brighton; *Cucullia asteris* and *Geometra smaragdaria*, from the south-east coast; varieties of *Vanessa urticæ*, from Compton, Berkshire, bred from a large number of larvæ taken there this year; a varied series of *Tæniocampa stabilis*, taken at sallows, Lakeside (Windermere) this spring, and a short bred series of *Endromis versicolor* (Scotch).—Mr. W. Buckley showed bred series of *Chærocampa elpenor*, *Saturnia carpini*, *Liparis salicis*, and *Hemerophila abruptaria*, and also series of *Nyssia zonaria*, &c.—Mr. W. P. Stocks exhibited a series of *Odontopera bidentata*, bred from a Manchester melanic female. He also showed specimens of a number of species taken at Trefriw, North Wales, which included:—*Euthemonia russula*, *Thyatira batis*, *Acronycta rumicis*, *Axylia putris*, *Miana literosa*, *Dianthœcia capsincola*, *Aplecta nebulosa*, *A. tincta*, *Cucullia umbratica*, *Pericallia syringaria*, *Tephrosia biundularia*, *Venusia cambrica*, *Boarmia repandata* (one a fine dark form), and *Emmelesia affinitata*.—Mr. W. B. Lees, a variable series of *Polyommatus phlœas*, *Xanthia citrago*, and a pupa of *Acronycta alni*, August, 1909, from Great Budworth, Cheshire, and *Tapinostola fulva* from Hough End, Clough.—Mr. W. Raeper showed, among other species, series of "*Bombyx*" *quercus*, bred, from Wilmslow larvæ, and *Heliothis marginatus*, bred, from Wallasey; a series of *Aplecta nebulosa* (including var. *robsoni* and intermediates), all taken at rest on tree-trunks in Delamere; *Cloantha solidaginis* and *Polia chi* (including var. *olivacea*) taken in Cheshire; a specimen of *Eurymene dolobraria* taken at Wilmslow.—Mr. L. Nathan, insects taken and bred, 1909, including *Cymatophora flavicornis*, bred, from Wincle, and several finely marked bred *Pieris brassicæ* (female, Manchester).—Mr. G. Storey exhibited *Argynnis aglaia* (female), *Acherontia atropos*, *Triphæna comes* (*orbona*) approaching var. *curtisii*, *Dianthœcia cæsia*, and *D. capsophila*, *Boarmia repandata*, all from the Isle of Man; series of *Nola cuculatella*, from Brooklands, Cheshire, and of *Nyssia zonaria*, from Blackpool; several *Aplecta nebulosa* var. *robsoni*, from Delamere, and a specimen of *Chærocampa celerio* taken at Ashton-onMersey, Cheshire, several years ago.—Mr. N. H. Davison showed a varied series of *Lasiocampa quercus* var. *callunæ*, from Wilmslow.—Mr. G. Bradburn showed *Nola cuculatella*, *Agrotis nigricans*, and *Oporabia autumnata*, from Brooklands, Cheshire; *Eupithecia laricata*, from Derbyshire; *Agrotis lunigera*, *A. lucernea*, *Stilbia anomala*, and *Orthosia upsilon*, from Penmaenmawr.—Mr. C. F. Johnson, F.E.S., exhibited light forms of *Dianthœcia carpophaga*, from Brighton pupæ, *Oporabia filigrammaria*, *Macaria notata*, *Cymatophora flavicornis* (Scotch), *Agrotis lucernea* (Witherslack), and *Numeria pulveraria*, bred from North Devon larvæ.—Mr. A. W. Boyd showed a bred series of *Agrotis ashworthii*, from North Wales; *Acronycta rumicis* var. *salicis*, bred from Delamere ova; a series of *Emmelesia blandiata* and a few *Venilia macularia*, from Cumberland; series of *Aspilates strigillaria* (Delamere), of *Nudaria mundana* (Grasmere), and of *Venusia cambrica* (Cheshire and Westmorland); bred *Triphæna fimbria* (Delamere and Rudheath), *Aplecta nebulosa* var. *robsoni*, and *Boarmia repandata*, black variety (Delamere); several *Lasiocampa quercus*, from North Wales larvæ, including a semi-transparent example with dark fringes; *Cœnonympha typhon* var. *phyloxenus*, taken in Delamere; a specimen of *Bomolocha fontis*, taken on July 6th, in South Cheshire, the second record for the county. All the above taken and bred in 1909.—Mr. J. E. Cope showed the following Coleoptera, taken on Ashton Moss in September, 1909:—*Carabus catenulatus*, *C. nemoralis*, *C. granulatus*, and *C. violaceus*.

November 3rd. — Mr. C. F. Johnson, F.E.S., President, in the chair.—An exhibition of and discussion on *Abraxas grossulariata* and *A. sylvata* and their varieties was opened by Mr. Crabtree, F.E.S. Of *A. grossulariata* he showed long series, including vars. *varleyata*, *lacticolor*, *lutea*, *chalcozona*, *sub-* and *semi-violacea*, *nigrosparsata*, *hazeleighensis*, *flavofasciata*, and *melanozona*. His *A. sylvata* showed very extensive variation, including banded and light forms, and many of the Yorkshire leaden form, which were also exhibited by Mr. R. Tait, Mr. A. Wright, and Mr. C. F. Johnson. Mr. C. F. Johnson's *grossulariata* included two extremely dark forms, the wings being entirely suffused with dark colour, through which the ordinary markings could be seen. Mr. A. Wright showed a most remarkable black and yellow aberration of *grossulariata* from Burnley. Other exhibits: Mr. Petrie, *Heliothis marginatus* (Wallasey), *Odezia atrata* (Chapel-en-le-Frith), *Pelurga comitata*, *Dyschorista suspecta*, and *Cloantha* *solidaginis* (North Cheshire), *Acidalia aversata* and *Ephyra punctaria* (Delamere).—Mr. Bradburn showed *Miselia oxyacanthæ* var. *capucina*, *Agrotis saucia*, and *Calocampa vetusta*, taken at sugar last October in Cheshire, and *Clostera anachoreta*, third brood, from Bournemouth.

December 1st. — Mr. C. F. Johnson, F.E.S., in the chair. — Mr. H. S. Leigh read a paper on the "Colour of Insects," and Mr. W. P. Stocks a paper entitled "Some Remarks on the Weather as affecting the Appearance of Lepidoptera."—Mr. R. Tait exhibited *Boarmia repandata*, bred during 1909, including series from North Wales, some of which were of the dark variety, from South Wales var. *conversaria*, and from Delamere.—Mr. C. F. Johnson showed butterflies taken at Digne and in Switzerland in July.—A. W. Boyd, B.A., *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Liverpool, November 15th, 1909. Mr. C. E. Stott, Vice-President, occupied the chair.—Mr. H. S. Leigh, of Manchester, delivered a lecture entitled "Leaf Insects." Mr. Leigh described the life-history and development of the insect *Phyllium crurifolium*, Serv., from the Seychelle Islands, which he had bred in captivity for the last three years. An exhibit of the living animals emphasised the truly remarkable resemblance they bear, both in shape and colour, to the foliage among which they live. A discussion ensued in which most of the members present took part.—Mr. F. N. Pierce exhibited the "stick" insect *Bacillus rossi*, alive.—Mr. W. A. Tyerman exhibited *Lasiocampa trifolii*; a fine series bred from larvæ found on the sandhills.—Mr. W. Mansbridge showed the Micro-Lepidoptera taken on the occasion of the Society's Field Meeting at Silverdale, N. Lancs, June 26th, 1909; these included:—*Argyrotoxa conwayana*, *Spilonota incarnatana* (larvæ), *Ephippiphora pflugiana*, *Retinia pinivorana*, *Dicrorampha plumbana*, *Lampronia prælatella*, and *Hyponomeuta irrorellus* (pupæ).

The Annual Meeting of this Society was held at the Royal Institution, Colquitt Street, Liverpool, on Monday, December 20th, 1909, Dr. H. H. Corbett, of Doncaster, Vice-President, in the chair.—The following gentlemen were elected officers and Council of the Society for the ensuing year, *viz.*:—President, S. J. Capper, F.E.S.; Vice-Presidents, E. R. Bankes, M.A., F.E.S., Robert Newstead, M.Sc., F.E.S., W. J. Lucas, B.A., F.E.S., C. E. Stott, Claude Morley, F.E.S., P. F. Tinne, M.A., M.B.; Hon. Treasurer, J. Cotton, M.R.C.S.; Hon. Secretaries, H. R. Sweeting, M.A., Wm. Mansbridge, F.E.S.; Hon. Librarian, F. N. Pierce, F.E.S.; Council, E. G. Bayford, F.E.S., W. D. Harrison, W. A. Tyerman, E. J. B. Sopp, F.R.Met.S., Wm. Webster, M.R.S.A.I., Geo. Arnold, F.E.S., Wm. Mallinson, W. T. Mellows, L. H. Lister, G. M. Taylor, M.A., J. H. Leyland.—An Address was delivered by Dr. H. H. Corbett, the retiring Vice-President, who took for his subject "The Evolution of the Natural Order Insecta." The lecturer, by means of lantern-slides and diagrams, described how possibly the great family of insects had arisen. Beginning with the simplest animal organisms, and proceeding to others more and more complex, Dr. Corbett constructed a tree showing the probable genealogy of moths, butterflies, and beetles. The Address was greatly appreciated by those present, and, at the close, a vote of thanks was proposed by Mr. R. Newstead, which was carried with acclamation.—Mr. C. B. Williams exhibited a box of Lancashire Micro-Lepidoptera, including *Scoparia ambigualis* from various localities, and *S. angustea* from Silverdale.—Mr. A. W. Boyd, a box of Cheshire Lepidoptera, the most interesting being: *Scoparia dubitalis*, Durham Park; *Boarmia repandata* var. *nigra*, Delamere; a curious dull form of *Venusia cambricaria*, and *Bomolocha fontis*, from Peckforton.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

RECENT LITERATURE.

Indian Insect Life; a Manual of the Insects of the Plains (Tropical India). By H. Maxwell-Lefroy, M.A., F.E.S., F.Z.S., &c. Assisted by F. M. Howlett, B.A., F.E.S. 4to, pp. i–xii and 1–786, plates 84. Calcutta and Simla: Thacker, Spink & Co. London: W. Thacker & Co. 1909.

This beautifully illustrated volume emanates from the Agricultural Research Institute, Pusa, and is published under the authority of the Indian Government.

As a general introduction to the insect fauna of a country it stands pre-eminent, and all who are in any way interested in the insect life of India are fortunate in having such a guide at their command.

In his treatment of the subject, the author has so judiciously blended entomological science with popular entomology that the work must commend itself to student and nature lover alike. Some idea of the comprehensive scope of the book will be gathered from the following summary of pages and illustrations devoted to the orders:—Aptera, pp. 43–46, text-figs. 1–4. Orthoptera, pp. 47–107, text-figs. 5–42; plates 6 col., 1 plain. Neuroptera, pp. 108–160, text-figs. 43–83; plates 1 plain. Hymenoptera, pp. 161–233, text-figs. 84–135; plates 4 col., 1 plain. Coleoptera, pp. 234–396, text-figs. 135(*bis*)–272; plates 10 col., 4 plain. Lepidoptera, pp. 397–541, text-figs. 273–346; plates 27 col., 3 plain. Thysanoptera, pp. 542–544, text-fig. 347. Diptera, pp. 545–664, text-figs. 348–434; plates 10 col., 4 plain (1. Siphonaptera). Rhynchota (Hemiptera), pp. 665–764, text-figs. 435–536; plates 11 col., 2 plain. Index, pp. 764–786.

Smithsonian Institution, United States National Museum. Bulletin 67: "Directions for Collecting and Preserving Insects." By Nathan Banks. 1909.

An excellent and instructive manual, that not only describes in some detail the most approved methods of obtaining various kinds of insects, but is also a concise introduction to systematic entomology. It should be almost as useful to the British collector as to his American confrère.

The author recognizes fifteen orders of Insecta, and each of these he discusses and illustrates by admirable figures of one or more species belonging thereto. The methods of collecting, rearing, and the subsequent treatment of specimens are also fully illustrated.

Altogether there are 188 text-figures; and including bibliography and index, 135 pages.

1. *Annals of Scottish Natural History, 1909.*

Though not mainly devoted to entomology, this well got-up periodical contains the following papers and notes on insects:—"Aquatic Coleoptera of the Solway District," a rather lengthy paper by F. Balfour Browne; "Coleoptera from Moles' Nests in the South-east of Scotland," by T. Hudson Beare and W. Evans; "On Some Scottish Diptera—Stratiomyidæ to Asilidæ," by A. E. J. Carter and J. Waterston; "Notes on Lepidoptera in the North-east Highlands," by D. Jackson; "*Hystrichopsylla talpæ* in Forth and Tweed," by W. Evans; "*Nemotelus uliginosus* in Forth," by W. Evans; "On Some Scottish Siphonaptera.—II.," by J. Waterston; "*Cryptocephalus aureolus* in Strathspey," by E. C. Maitland-Dougall; "Two New British Diptera," by P. H. Grimshaw.

2. *The House Mosquito—a City, Town, and Village Problem.* By J. B. Smith, Sc.D. (New Jersey, Agr. Exper. Stations, Bull. 216). Nov. 24, 1908.

This is our familiar mosquito (*Culex pipiens*), which, though often common and troublesome enough out of doors, seldom becomes with us a household nuisance. Those who are waging war against the house fly should examine this well-illustrated paper, although of course the life-history of the mosquito is very different from that of the house-fly.

3. *Dragonflies of Mississippi Valley, collected July and August, 1907.* By C. B. Wilson. (Proc. U.S. Nat. Mus. xxxvi. pp. 653-671.) Washington, 1909.

4. *On Brazilian Grasshoppers of the Subfamilies Pyrgomorphinæ and Locustinæ (Acridinæ of authors).* By J. A. G. Rehn. (Proc. U.S. Nat. Mus. xxxvi. pp. 109–163). Washington. 1909.

A well-illustrated systematic paper.

5. *The North American Dragonflies (Odonata) of the Genus Macromia.* By E. B. Williamson. (Proc. U.S. Nat. Mus. xxxvii. pp. 369–398, pl. 35–36). Washington, 1909.

More than a simple systematic list.

W. J. L.

Memoirs of the Department of Agriculture in India. (Entomological Series.) Vol. ii., No. 7. Pp. 111-137, plates x., xi., and xii. December, 1908.

In this number Mr. Maxwell-Lefroy discusses Indian scale insects (Coccidæ). On the coloured plates are depicted various stages in the life-history of some of the species referred to.

Hawaiian Sugar Planters' Association. Division of Entomology. Bulletin No. 6. The Hawaiian Sugar Cane Bud Moth (*Ereunetis flavistriata*), with an Account of some Allied Species and Natural Enemies. By Otto H. Swezey. Pp. 34, plates i.–iv. Honolulu. October 25th, 1909.

Yours sincerely
G. W. Kirkaldy

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GEORGE WILLIS KIRKALDY, F.E.S.

We are deeply grieved to announce the death, on February 2nd last, of our highly esteemed colleague, whose name has been a familiar one in the pages of this Journal for several years past. Mr. G. W. Kirkaldy was the youngest son of the late Mr. W. H. Kirkaldy, of Wimbledon, and was born at Clapham in 1873. A love of Natural History was evinced at a very early age, and later it became a passion with him. He was educated at the City of London School, and whilst there was appointed Curator of the School Museum. Joining a Debating Society at the Presbyterian Church, he, although only a young lad, read some excellent papers, notably one on the "Coloration of Insects."

After entering upon City life he devoted his evenings to Entomology either in the field or the study. Always a great reader, and possessing an excellent memory, he rapidly equipped himself for the work he proposed to undertake when he could devote the whole of his time to a scientific career.

The offer of a post, under the U. S. Government, on the entomological staff of the Department of Agriculture and Forestry at Honolulu (subsequently transferred to the Hawaiian Sugar Planters' Association), was readily accepted, and in 1903 he went out to Hawaii to take up the appointment. Here he seems to have been quite in his element, with plenty of work of the quality he most desired awaiting his able investigation. Soon after settling down in Honolulu, however, he met with the unfortunate riding accident that proved a trouble to him during the remainder of his life. The bone of the injured leg, which had been fractured in five places, did not unite properly, and although he submitted to two separate operations later on, he was not satisfied with the result. When on a holiday visit to San Francisco at the beginning of the present year he appears to have been persuaded to undergo still another operation, but he only survived it five days.

In 1897 Mr. Kirkaldy published in the 'Entomologist' "Notes on the Genus *Sigara*" (September), and "Synonymic Notes on Aquatic Rhynchota" (October). He commenced "A Guide to the Study of British Waterbugs (Aquatic Rhynchota)" in 1898 (Entom. xxxi. p. 177). This was continued at intervals extending over eight years, but was practically concluded in 1906 (Entom. xxxix. p. 154), when it comprised sixty-six pages, together with two plates of structural details.

His contributions to the literature of Hemiptera are chiefly concerned with the nomenclature and bibliography of the Order, but he also wrote articles and notes on other phases of the subject, among which may be mentioned, in addition to the "Guide," already referred to, "The Stridulatory Organs of Waterbugs" (Journ. Quekett Microsc. Club, April, 1901), "Hemiptera" (1902, 'Fauna Hawaiiansis,' vol. iii.), and "Upon Maternal Solicitude in Rhynchota and Other Non-Social Insects" (1903, Entom. xxxvi. pp. 113–120; and 1904, Ann. Rep. Smith Inst., pp. 577–585).

It is true perhaps that the "rule of priority" is recognized by most systematists, but few, seemingly, regard the rule as being unalterable. Kirkaldy in Hemiptera (as also Prout in Lepidoptera) believing that anything approaching stability in nomenclature was only to be secured by the acceptance of names as these were written by their respective authors, rigidly objected to orthographic emendation being admitted on any plea whatever. Strict priority without exception of any kind was the predominant note in all his nomenclatorial work. His researches into the intricate subject of generic synonymy occasionally brought him into conflict with co-workers who held opinions opposed to his own. He was, however, ever ready to admit error, and was always thankful to those who put him right when he went astray. His sole object was to obtain an approximately definite adjustment of questions affecting generic nomenclature upon which his 'Catalogue of the Hemiptera' might be based. The first volume of this monumental work, estimated to run to six or perhaps seven volumes, was published in 1909, and embraces the Cimicidæ. Volume ii., dealing with Thyreocoridæ, Urolabididæ, Aradidæ, and Coreidæ, we understand, is in the press. Volume iii., treating of Pyrrhocoridæ, Myodochidæ, and Tingidæ, was in preparation.

Mr. Kirkaldy was elected a Fellow of the Entomological Society of London in 1893. In 1901 he joined the Reference Committee of the 'Entomologist.'

He leaves a widow and one daughter; his little son died about twelve months ago.

NOTES ON *LUPERINA GUENÉEI*, Dbld.

By Eustace R. Bankes, M.A., F.E.S.

In the course of his interesting paper on "*Luperina guenéei*, Dbl., and var. *baxteri*, var. nov.," published in Entom. xlii., 289–292 (1909), Mr. Richard South says, p. 290, that the National Collection includes "a female type" of *guenéei*, and that "a co-type" of it passed from the Mason collection into mine. Seeing, however, that Doubleday's original description in Ent. Ann., 1864, pp. 123–124, was made from these two individuals, *one being of each sex*, it follows by the 'Merton Rules,' p. 13, Rule 38 (1896), that together they constitute the "type," my example being the type male, while that in the National Collection is the type female. The term "co-type" is reserved by the authors of these Rules for use in cases where the description has been made either from two individuals, both of which represent the same sex, or from more than two units. At the dispersal of the Burney collection in 1893, the type male, as well as the type female, was purchased by Mr. O. E. Janson, who, in answer to my inquiries, informs me that he sent the former to the late Mr. P. B. Mason, and the latter to the Trustees of the British Museum, on whose behalf it had been secured. Barrett is, therefore, in error in stating [Lep. Brit. Isl., iv. 335 (1897)] that, after the death of the Rev. H. Burney, both specimens passed into the collection of "Dr. P. B. Mason,"* and that the latter gentleman deposited one of them in the National Collection. I have carefully compared these individuals with one another, and also with several of those taken in Lancashire, during the past season, by Messrs. T. Baxter and W. Yates, and all are certainly conspecific.

Since Mr. South (*loc. cit.*) reproduces Hodgkinson's note [Entom. xviii., 54 (1885)], in which the writer gives the date of his purchase—and, by implication, of the capture—of the two *guenéei* that went into the Burney collection, as "1860 or 1861," it may be as well to mention that the precise year in which these, and the other original specimen, that was sent to Miss Sulivan, were secured, is somewhat uncertain. In Ent. Ann., 1864, p. 123, Doubleday definitely states that they were taken "in the autumn of 1862," and Barrett, in Lep. Brit. Isl., iv., 335 (1897), follows him as regards the year, though he informs us that they were captured "in August," which is not one of the autumn months. Miss Sulivan, however, writing recently to Sir George F. Hampson, says that her collection still contains the example of *guenéei** received from Hodgkinson, and that the label belonging to it reads:—"Taken by Porter and Stephenson of Bolton, at Rhyl, Aust. 12th, 1860": the year specified practically agrees with Hodgkinson's "1860 or 1861," and it seems most probable that the moths were really captured in 1860, and that the "1862" of Doubleday and Barrett is not accurate. Although I have examined, in my own and other collections, some extraordinarily pale aberrations of *L. testacea*, not one of them at all reminds me of the true *guenéei*, and ever since the acquisition, and careful comparison, of the type male of the latter in 1905, I have been unable to accept the opinion of Barrett and others that it is only a form of *testacea*, and regard it as highly satisfactory that Doubleday's action in separating it has at last been *proved*, by the evidence of the genitalia, to have been fully justified. It would be of great interest if Mr. Sydney Webb would inform us whether the two reputed *guenéei* in the Bond collection are really referable to Doubleday's species. In Lep. Brit. Isl., iv., 335 (1897), Barrett says that they do not fully agree with "this variety of *L. testacea*," that is, with *L. guenéei*, Dbld., which he has just stated to be, in his opinion, only an extreme form of its close ally.

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* Mr. P. B. Mason, M.R.C.S., although no less distinguished as a physician than as a surgeon, and popularly known as "Dr. Mason," did not receive the degree of "M.D.," and consequently never assumed the title of "Doctor."—E. R. B.

Besides the differences in colour, *L. guenéei* seems to be, on the whole, a rather smaller species than *testacea*. I have examined eight British examples of the former and scores of the latter, and although both insects vary considerably in size, the *guenéei* are, on an average, certainly smaller than the *testacea;* they are, in addition, narrower in the fore wing, although strikingly narrow-winged examples of the latter are very occasionally met with. From Entom., xliii., 42 (1910), we learn that the Rev. C. R. N. Burrows is not acquainted with the "three round white dots on the costa near the apex," which are stated by Doubleday (Ent. Ann., 1864, p. 124) to be "so distinct" in *testacea* but absent in *guenéei*. In my experience, however, the three pale dots, to which Doubleday obviously refers, are, in nearly every instance, visible in the former, though they are not always equally distinct, and more frequently exhibit some shade of buff than of white. Three similar white dots, in precisely the same positions, are sometimes present in *guenéei*, and I can (*pace* Doubleday) even distinguish them with certainty on the left fore wing of the type male, though on the right fore wing they are not discernible. But seeing that Doubleday (*tom. cit.*, p. 123), after alluding to "a pale patch on the costa near the apex," specially says, "On the costa near the apex are two oblique white spots," and that the type male* shows no white spots or dots in such a position with the exception of the three just mentioned, one is forced to the conclusion that Doubleday only noticed the two posterior dots, and did not realize that they correspond exactly to the two outer dots of the series of three that he knew so well in *testacea*.

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* Hodgkinson appears to be responsible for this identification, which, although not yet confirmed by any authority, is presumably correct. In any case, no question of importance rests upon it, and the value of the evidence afforded by the label, in considering the question of the date of capture of the type specimens, would in no way be affected, even if Hodgkinson's determination were proved to be incorrect.—E. R. B.

Mr. South (*tom. cit.*, p. 292) says that the question whether *L. nickerlii* is, or is not, a form of *testacea* must await the result of further examination of the genitalia. But while fully realizing the immense value of the evidence afforded, in numerous instances, by these appendages, I am quite unable to subscribe to the idea that any two forms that appear, on other grounds, to be distinct species, must be considered conspecific *unless* the genitalia show marked differences. The eight specimens of *nickerlii* in the National European Collection differ so noticeably from *testacea* in the ground-colour, which is much darker, in the stigmata, which are white and consequently far more conspicuous, and in the hind wings, which are, like those of *guenéei*, decidedly whiter, that its specific status seems to me in no way jeopardised by the possibility of the genitalia yielding no proof of its distinctness.

I greatly regret to find that the explanation at the foot of the plate accompanying Mr. South's paper in Entom., xlii., pp. 289–292 (1909) is incomplete, and consequently very misleading. It tells us that the figures represent "*Luperina nickerlii* and *L. guenéei baxteri*." This is true of the imagines figured, but anyone, with the plate alone before him, could only conclude that figure 5 shows the genitalia of *nickerlii* (this being the species named first in the explanation), and that figure 6 represents those of *guenéei* var. *baxteri*. *Both* conclusions would be erroneous, for, on turning to p. 292, we learn incidentally that the appendages exhibited in figure 5 are those of the "new species," while those seen in figure 6 belong to *testacea!* The "new species" of Mr. Pierce's report, written before he became aware of the fact, is, of course, *L. guenéei*, Dbld.

The opinion has been expressed to me that, in equally fresh individuals, there would be no distinction at all between typical *guenéei* and var. *baxteri*, South, and that the apparent difference is merely due to the pale grey ground-colour having, in the course of time, assumed a somewhat ochreous tinge. On first placing fine examples of var. *baxteri* beside the type male of *guenéei*, which, in its present condition, only differs from them in that it is distinctly luteous instead of distinctly grey, this same idea occurred to me, and I doubt whether anyone, with these individuals alone before him, would have ventured to bestow a varietal name upon the former. A comparison, however, of var. *baxteri* with the type female of *gueneei* made it at once evident that the browner tone of the latter was not due to discoloration, and the fact that, in the original description, made within some three years of the capture of the type specimens, the ground-colour of *gueneei* is stated to be "pale testaceous," which epithet is not applicable to that of var. *baxteri*, affords additional proof of this. The type male of *gueneei*, which is also somewhat larger and more robust in appearance, is a shade paler than the type female, but the former, although absolutely free from any suspicion of grease, is in less good condition, being rather worn. My firm belief, based upon careful study, is that neither has changed colour since the date of capture, and that Doubleday, holding, as I do, that the male, when fine, resembled the female more closely in colour, abstained from mentioning the difference between them, and deliberately chose the term "pale testaceous" to describe the hue which, in his opinion, had prevailed in both when equally fresh. Certain of my paler *testacea* would, apparently, if similarly worn, be precisely concolorous with the type male of *gueneei*. Furthermore, Mr. South informs me (*in litt.*, 26, xi., 1909) that some of the specimens of *gueneei* taken by Mr. Baxter *during the past season*, as well as the solitary individuals secured by him in 1889 and 1891, "might be described as testaceous, and have an ochreous brown tinge," and adds, "The form I have named *baxteri* lacks this tint, and is of a paler grey colour than the B. M. type [*i. e.*, the type female of *gueneei*.—E. R. B.]." I may mention that Mr. South's decision to describe *baxteri* as var. nov. was based on a comparison of it with the type female with *gueneei;* he has not seen the type male since it passed into my possession in 1905, for there was no opportunity of showing it him when I took it to London, last December, in order to compare it with the type female.

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* The point in question had not arisen when the opportunity of examining the type female occurred.—E. R. B.

Norden, Corfe Castle: February 8th, 1910.

[Mr. Sidney Webb has kindly sent the two specimens of *Luperina* that stood as *L. gueneei* in the Bond Collection. Barrett was of opinion that these were only light forms of *L. testacea*, and there is no doubt whatever that this is so. The specimens have been submitted to Mr. E. R. Bankes, and he also refers them to *L. testacea*.—R. S.]

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 11.)

The specimens of *athalia* from Wiesbaden in Mr. Prideaux's collection approach more nearly to *deione* than any others I have seen; even the *x*-mark of the marginal blotch, up. s., is exactly reproduced in one specimen, and in another the black lunules of the un. s. h. w. appear, whilst the contrast between the two divisions of the central band on the same wing is much slighter than usual. They are smaller and lighter than is usual in Switzerland, and approach nearer to average English specimens; those, however, from the Salève (Haute Savoie) are also somewhat small and light. The only approach made by specimens of *athalia* towards *parthenie* appears to me to consist in the partial or entire absence of the extra line up. s. h. w., which certainly gives a superficial resemblance to the latter species, but I have never yet come across a specimen with this peculiarity, in which the f. w. and the palpi did not at once suffice to determine the species. There certainly does exist, however, some confusion in the minds of various authors between these two species, the climax of which seems to be reached in Giard's paper in the 'Feuille des Jeunes Naturalistes,' xxxiii. p. 44 (1905), on the Argynnides of Northern France, in which the whole account of *athalia* obviously refers to *parthenie* and *vice versa*, whilst the names are used with absolute correctness by Dupont in his paper on p. 80 of the same volume on the Argynnides of Normandy. Oberthür's paper in the Ent. Rec. xv. p. 313 really ought to dispose of any difficulty in separating the species, in Northern France at any rate. An occasional broadening of the black edging of the nervures in small specimens occasionally produces some resemblance to *aurelia*, but the lunules of the outer band in un. s. h. w., and often also the shape of the wings, which as a rule are more elongated in the latter species, will suffice to prevent mistakes. I have never seen any near approach to *dictynna* on the part of *athalia* except from Bukowina, though the converse occurs, and the same fact may be stated with regard to *britomartis*, though of course a glance at the under side in either of these cases would at once settle the question. I have already mentioned the resemblance between *athalia* and *dictynnoides* in Bukowina; the specimens given under the latter name from the Ural in the National Collection are, in my opinion, probably *athalia* approaching even more closely to *dictynnoides*, but in the absence of exact data it is impossible to pronounce definitely on the subject. This species never approaches either *varia* or *asteria*.

The extent of variation in the bands of the ground colour on the up. s. is sometimes very remarkable in the female. There are in the National Collection several specimens from Germany with a distinctly pink tint in some of these bands; in one from the Elwes collection, taken at Kruznach, and another with no distinctive label, this peculiarity is so pronounced as to remind one of *maturna* var. *wolfensbergeri*. A similar specimen, in company with a fairly ordinary female, both coming from the Leech collection, are labelled "hybr. *Mel. Phœbe* and *Athalia*"! without a shadow of excuse. In 'Iris,' xviii. p. 12, another similar aberration is mentioned, and illustrated on pl. i. fig. 5; this again approaches somewhat closely to var. *wolfensbergeri*; it was bred in 1905 from a larva found at Werdau, in Saxony, so that there ought to be no doubt as to the species to which it belongs. Specimens showing a melanic tendency, without reaching even approximately the *navarina*-form, are by no means uncommon; it will suffice to refer to the specimens taken at Martigny, and more particularly at Luan, by Mr. Sloper, mentioned in Ent. xxxviii. p. 27, and those described by Aigner-Abafi in his paper in the 'Annals of the Hungarian National Museum for 1905,' pp. 496 *et seq.*

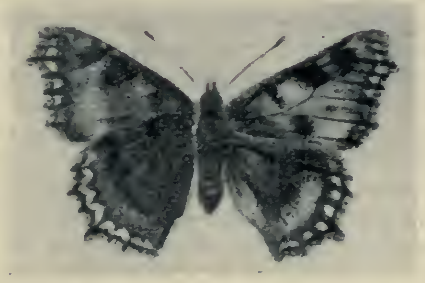
Oberthür, in his 'Etudes de Lépidoptèrologie comparée,' speaks of *M. deione* as a very constant species; yet its limits of variation hardly seem less than those of others of this group. On p. 11 of this work he speaks of a melanic specimen of the *berisalensis*-form, taken by Wullschlegel at Martigny, which the illustration, pl. i. fig. 7, shows to be of a somewhat extreme character; but, apart from extreme aberrations, it varies in detail in all the same directions as *athalia* and others. Its variation in size, especially between the first and second broods, has already been mentioned, and the female exhibits a greater degree in difference of tint between the different bands of the up. s. than does any other of the group. Reference has also been made to its racial distinctions (vol. xlii. p. 149), but it will be better to speak somewhat more fully as to these at this point. The darkest race of all is the form of *berisalensis* found at Sierre and at Ormona, above Sion, these examples being considerably darker than those of Martigny. The lighter specimens from the latter locality are very close to those from Granada, especially the males; the South Spanish females are, however, more variegated on the up. s. than even the most variegated of the Swiss. The lightest I have seen have come from the French Pyrenees; almost as light as these are those from Digne and the Riviera. The Spanish forms seem mostly to be darker than the type, with the exception of the light race from the Sierra Nevada. A new locality has lately been discovered for the species at La Grave, in the north of the Hautes Alpes, the specimens from which are large and lightish, the un. s. of those I have seen being specially light. So far the expressions light and dark have referred to the ground colour, but there is also a very great difference in the breadth and intensity of the black markings on the up. s., and on the f. w. of the un. s.; occasionally also the two portions of the central band are of slightly different shades, which brings the insect somewhat closer to *parthenie*. In the North of Spain the two insects become indeed very difficult to distinguish, but this is mostly due to the variation of *parthenie*, and will be treated of under that insect. The only other species of the group to which *deione* now seems to approach is *athalia*, and this only in the darker and more heavily marked forms of the former, and only on the up. s., the un. s. always affording abundant distinction.

Few as are the varietal or aberrational names to which *parthenie* has given rise, it is a very variable insect. In Central France it reaches a large size, and is brightly coloured, belonging frequently to Caradja's form *beata*—more distinctly so, indeed, than many of the specimens from the French Pyrenees themselves. In the Eastern French Alps, on the contrary, they are inclined to be small, though perhaps somewhat larger than those from Switzerland, except at a height (about 3000 ft.) where the species begins to be single-brooded. In Central Italy the ground colour becomes very light, the markings also being generally slighter than in other races; this is even more noticeable on the un. s., the broad and scarcely divided central band being often very remarkable, especially in the females. This race is not specially small, and occasional specimens have the markings quite up to the average, but in all I have seen the ground colour remains light. An extreme contrast to this form is afforded by the Spanish race, whose dark ground colour and heavy markings and variegated females bring them very near to the dark *berisalensis*-like form of *deione*, which is found in the same localities. These characters are apparently common to the species from Northern Spain to Andalusia. I am entirely at a loss what to say as to German specimens of *parthenie*, as nothing I happen to have seen from Germany purporting to be this species has any near resemblance to it. It must occur, one would think, in the west and south-west, but the writings of German authors on the subject leave one in considerable doubt. This doubt begins to arise when serious comparisons are made between *parthenie* and *aurelia*, two of the most widely different species of the whole group; unless, indeed, these comparisons are intended to include *varia*, a species much more closely connected, in my opinion, with *aurelia* than with *parthenie*, but which can hardly occur except in the very highest elevations in Germany, though the earliest descriptions and illustrations of *parthenie* seem rather to represent a light form of *varia*. This is one of the many points which still requires careful investigation; the material at present at my disposal is wholly insufficient for the purpose, but I hope at some future time to be able to clear up this (and some few other points) satisfactorily. With regard to aberrational, as distinct from racial, forms, *parthenie* is quite as rich as *athalia*, though only two—*jordisi*, Rühl, and *aphæa*, Freyer—have been named, and even the latter name was given, so to speak, accidentally. Yet every form of *athalia*, whether of the *navarina* or the *corythalia* group, has its counterpart in this species also. Melanic forms are given by Aigner-Abafi in his paper above mentioned, and by Oberthür in the 'Bulletin de la Société Entomologique Française,' vol. v. pl. i. (1900), and in this latter place is also illustrated one of a precisely opposite character, almost the whole of the wings being covered with the ground colour; and of the seven under sides illustrated the author says that four, *viz.* three males and one female, have the up. s. similar to this latter. All these four have the un. s. f. w. very slightly marked except for the lunules, and all have the outer two-thirds of the h. w. albinistic, the outer dark band being represented in the four specimens by (1) indistinct dots, (2) a dark edging to the lunules of the terminal band, (3) a row of very indistinct, and (4) slightly more distinct lunules respectively; the basal third is in all cases dark, the spots showing but little. It will be seen that all these belong to the *jordisi* group of aberrations, but carried considerably farther on the up. s. than the specimen described by Rühl, and less marked on the un. s. f. w. Of the other three un. s. specimens illustrated, one has the un. s. left h. w. of the same form, but less markedly so, whilst in the right h. w. the outer band is unusually dark, and invades the lunules of the terminal band; the greater part of the right f. w. un. s. is also dark. The other two under sides are melanistic. The minor variations—tint of ground colour, variegation in the up. s. of the female, breadth of dark lines up. s. and of bands un. s.—have quite as wide a range as in *athalia*. With regard to the approach of *parthenie* to *varia*, I know how fatally easy it is to be misled by a superficial resemblance in the males, especially when one only has one or the other species before one. In the early days of my Swiss collecting I fell into this error myself, and the statement made in the 'Entomologist's Record,' vol. xiii. p. 118, remains as a constant reminder of my mistake; but I am soothed by the reflection that I erred in the company of the nearly infallible Kane, who says (Entom. xix. p. 145) that the "oromorphic form of *parthenie* graduates insensibly into *varia*," whereas in truth the oromorphic form of *parthenie* does nothing of the kind except with regard to size. The same observation is made by Bath (Ent. xxix. p. 11) with regard to specimens from Randa, near Zermatt, and (Ent. xxx. p. 210) from Gavarnie, at a height of from 5000 to 6500 ft. Now these two localities probably represent the extreme height to which *parthenie* ever mounts in the Valaisian Alps and the Pyrenees respectively, and I have seen specimens from both ranges. The superficial resemblance to *varia* is at first sight marked, but a comparison made between them and the *varia* of the high Alps on the one hand, and the ordinary Swiss forms of *parthenie* (especially the subalpine forms) on the other, will serve to place the matter beyond dispute. The table given in vol. xli. pp. 304–307 will be found helpful in this matter. The very small specimens of *parthenie* in the National Collection, brought by Mrs. Nicholl from the Piz Europa, serve to bring out very strongly the differences between the two species; though they are as small as the smallest *varia*, it would be almost impossible to confuse them. The only females I have ever seen about which any uncertainity could arise are the very light specimens taken by Mr. A. H. Jones at Campfer, in the Engadine.

(To be continued.)

VARIATION OF *V. URTICÆ*, L.

By T. Reuss.



Since I began, in 1906, to pay some attention to the facial changes possible in the Vanessidæ, I have taken particular interest in any variation exhibited by the normally dusky, plain-hued under sides of *urticæ*, *io*, *polychloros*, and others. As is well known, the under sides of these imagines are undoubtedly under certain conditions of protective value to their possessors, by causing them to resemble bits of wood, dry clay, &c. Any new departure in facial development, tending to paint bright decorative colours into such under sides and thus to deprive them of, or to lessen, their protective value, would naturally be worth while to observe.

Now though I have reared over twelve thousand larvæ of *V. urticæ* and *io*,* only three or four perfect individuals have come to my notice, which plainly showed the tendency to develop an under side facies with conspicuous colours in it.

On September 13th last I bred the above aberration of *V. urticæ* from wild Hertforshire larvæ, which is remarkable for the chain of light bluish-grey lunules on the under side of the wings. Groups of shining white scales in the lunules brighten them and, in the live insect, the lunules looked very conspicuous and decorative. I therefore suggest the descriptive name of ab. *subtus-ornata* for this form. I took the specimen out into the garden, soon after the wings were fully developed, and, placing it on tree-trunks, logs of woods, &c., I noted its appearance when resting with closed wings on these objects. In every case the decorative chain of lunules caused the insect to look "ornamental," and quite unlike a bit of bark, rotten wood, or any of the other things which the normal under side of *urticæ* seems to imitate. The under side of the aberration was evidently, therefore, much less protective than that of the normal form. The hind wings, and especially the central and basal area of the primaries, were suffused with a rich purplish brown (the colour of the well-known pigment "burnt sienna"), and the broad black bands looked rich and glossy in the sunshine. Soon, however, the wings of the insect began to vibrate in the manner common with butterflies when they prepare for flight; they raise the vitality (and temperature) in their bodies by these vibrations, expand their air-receptacles, and then suddenly fly off—which was precisely what the aberration did, or tried to do, thus putting an end to my observations. I succeeded in re-capturing it with the net, but not before it had made a beautiful display of its dark, fiery upper side, which showed a purplish gloss on the dark wing parts and on the white spotted margin, and reminded one of *P. atalanta* in many respects. Prof. Standfuss recorded on p. 54, Hdbk. of Pal. Butt., 1896: "Bruand saw in the collection of Mr. Peythieu, in Locle, a hybrid of *atalanta* and *urticæ*, which had been captured three times in fifteen years, near Locle. A record of this is found in the Ann. Soc. Entom. de France, ser. 2, 1844, t. ii. Bull. p. vi." If the three specimens in question were really the offspring of *natural fertile pairings* between the two species, then such a fact would, I think, suffice to show that *atalanta* and *urticæ* were much more closely related than one had otherwise suspected, *fertile* pairings being the best of proofs in this sense—and might give signs of their affinity also by occasional "parallel" variation in facies.

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* A specimen of *V. io* (a heat-form) developed a few brilliant metallic blue and green scales at the apex of the fore wings, just underneath one of the white spots in the ocellus, and in the same place where such metallic scales are to be found in the under side of *Polygonia* (*Vanessa*) *c-album*.

But even if the account of fertile pairings of *urticæ* and *atalanta* were based on an error, I should yet think "parallel" variation to be possible, and even capable of producing imagines that might be mistaken for hybrids of the two species, as, for instance, is certainly the case with *urticæ* and *io*.

THE TAPS OF THE "DEATH-WATCH BEETLE."

By C. J. Gahan, M.A.

In Mr. Claude Morley's communication on this subject in the January number, p. 31, there are two statements of fact which more than suggest that the "Death Watch" concerned was not an *Anobium* at all. The tapping was heard in the month of October, and the number of taps given in succession without a break was thirty at least, according to his own computation, and therefore considerably in excess of the highest number ever attributed to *Anobium*. Both facts point to the "Lesser Death Watch" (*Atropos divinatoria*) as the source of the noise.* It appears that the ticking of *Anobium* is generally heard in the spring; and in none of the accounts that I have read has a ticking, when heard late in the year, been definitely traced to the action of an *Anobium*. On the other hand, it is during the summer months, from July onwards, that one is most likely to hear the ticking of the Lesser Death Watch. I have myself heard it in the month of October and again at the beginning of December, 1891, under circumstances which are to be found reported in the 'Proceedings' of the Entomological Society for that year (p. xxxiii). Westwood gives an account of a ticking noise which he heard going on in the wooden mantelpiece of his study throughout nearly every month of the year, including October. The mantelpiece was inhabited by *Anobium striatum*, and he attributed the noise to the action of the larvæ in gnawing the wood, thinking it very unlikely to be due to the perfect insects. But I strongly suspect that a good deal of the ticking in that case also was the work of the Lesser Death Watch.

The Rev. W. Derham, who, a little more than two hundred years ago, gave one of the fullest and most accurate accounts we have of the ticking of the death-watches, both "the greater" and "the lesser," pointed it out as a distinction between the two that, whereas the one "beats only about seven or eight strokes at a time and quicker," the other "beat some hours without intermission, and his strokes are more leisurely, and like the beats of a watch."† This "most accurate and minute observer," as Dr. Sharp describes him, has explained in full detail exactly how the *Anobium* or Greater Death Watch makes its ticking noise, and his account has since been abundantly confirmed by other acute observers. Entomologists from time to time have shown a reluctance to accept all his statements as true, but gradually the unbelievers have been converted, and now, so far as I know, there is only one left.

Mr. Swinton cannot believe that *Anobium* makes its ticking sound by hammering its head against the wood on which it stands, and this in spite of the evidence of such highly reputable authorities as Latreille, H. Doubleday, F. Smith, and the Rev. L. Jenyns, to mention only some of those who have been actual witnesses of the performance. His own suggestion in the February number (p. 64) as to the manner in which the sound is produced will scarcely stand the test of investigation. I have examined afresh both *Anobium striatum* and *A. tessellatum*; but in neither of these species have I been able to find the special structures he has figured and described. The apical area on the under side of the elytron which is represented in his figure as being crossed by oblique lines or ridges is, as a mattter of fact, covered by a delicate pubescence having a silvery appearance, and is not crossed by a single ridge. This suggests to my mind that there has been a mistake in the identification of the species, for it is true, as pointed out in my paper on the "Stridulating Organs in Coleoptera" (Trans. Ent. Soc. 1900, p. 439), that certain species of *Anobium* show a series of ridges somewhat in the position indicated in Mr. Swinton's figure, but it has never been shown that any of these species tick like the death-watches.

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* The very late date at which I heard these taps was, as I showed (*loc. cit.*), what primarily led me to draw attention to the subject. At the time I was so sceptical—or ignorant!—of the tapping of *Atropos* that it did not even occur to me. Mr. Gahan tells me that he once heard a tapping, and traced it to a box on the mantelpiece, which contained nothing whatever but *Atropos*: this is very conclusive. No doubt can remain that the multi-taps of the insect I heard are referable to the same species.—C. M.

† This is both curious and interesting; for, as I was at some pains to show, the taps were incalculably frequent in my case.—C. M.

Although unable to agree with Mr. Swinton, I gladly recognize his very praiseworthy spirit of enquiry, and should like now to offer him a suggestion.

Spring will very soon be here. April and May* are, I find, the months in which the plaintive notes of the Anobiids (*A. tessellatum*,† in particular) have been most often heard, and their amours displayed before the eyes of prying enquirers. If Mr. Swinton will endeavour to obtain some lively specimens during one of those months, and keep them by him on a table, either in a little box or under a glass, as others have done, he may meet with a like success, and be able to satisfy himself as to how exactly the sound is made. As I have never witnessed the tapping of *Anobium*, I shall be glad to have the chance of trying a similar experiment, and I hope that other readers of the 'Entomologist' may be induced to do likewise and let us know the result.

There are one or two small points that might be settled,‡ since there is a slight discrepancy in the accounts (most of which apply to *A. tessellatum*). First, as to the number of taps given in succession without a break:—Derham, as we have seen, states it to be seven or eight, while F. Smith gives it as "four to five, usually five," and Doubleday as "generally about five or six." And, secondly, as to how the tapping is done. According to some, the beetle strikes with its mandibles against the wood; but Derham, who seems to be on the whole the most reliable authority, is very explicit on this point, and says that it strikes with its "forehead," not with the lower part of the face, or upper lip, as it was said to do by Allen who, a few years before, had started the discussion of the subject in a paper sent to the Royal Society.

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* Is the imago of *A. domesticum* = *striatum* emerged by April or even May?—*cf.* my notes (*loc. cit.*).—C. M.

† Perhaps *A. tessellatum* is a household insect, though not (if I correctly recollect) given by Mr. E. A. Butler as such. Indoors, I have it only from an eight-hundred-year-old beam of Ely Cathedral. At all events, such as I have found came from paludose willows in early May; and it does not occur in my old house at Monk Soham, where I have heard (this time *really*) *A. domesticum* tapping in the "watches" of a toothache night, as it *should* tap, four-to-eightly.—C. M.

‡ Another is the association, parasitism or inquilinism, of *Corynetes cæruleus* on this beetle. Both are abundant in my house, but I never saw the former alive till I went there in 1904. It is common on ceilings and windows, always a little before the time of appearance of *A. domesticum* in

EFFECTS OF TROPICAL TEMPERATURE ON BRITISH PUPÆ OF *MANDUCA ATROPOS*, AND STRIKING SPECTACLE AFFORDED BY THE MOVABLE "DEATH'S-HEAD" ON THE THORAX OF THE MOTHS.

By T. Reuss.

During the first days in October, 1908, four large larvæ of *M. atropos* were brought to me from a potato-field here in the vicinity (Ware, Herts), but two of these proved to be injured by rough handling. The other two were fine full-grown specimens, and they began to lose their beautiful green, bluish, and yellow colours in exchange for a brownish yellow already on the day following their capture. Soon they were preparing for pupation by burrowing energetically in the loose sand at the bottom of the breeding-cage in search of a suitable hiding-place.

After four days, observing that all movement in the sand had ceased, I searched for the larvæ, and found them each lying in a separate cave with firm walls, which they had made in the sand. Intending to climatize the pupæ in tropical temperature, I removed the larvæ to a suitable box, and there they pupated on the evening of October 8th in a temperature of 30° C. in artificial glass-topped sand caves. I did not allow the mercury to fall below 23° C., and under these conditions the pupæ emerged on October 31st in the evening, almost simultaneously,

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June, continuing for hardly a month. Another small point that might (inhumanely) be settled is De Geer's affirmation that "You may maim, pull limb from limb, or roast over a slow fire this pertinacious creature (*Anobium pertinax*), and not a joint will move in token that it suffers," which appears contrary to the fundamental laws of self-preservation. One of the best figures of *A. domesticum* is given (*bis*) in that somewhat neglected, because unindexed, but most delightful book, 'Episodes of Insect Life,' by "*Acheta Domestica*, M. E. S." (Miss Budgen), iii. 1851, 126.—C. M.

after only twenty-three days of pupal development. The temperatures were measured by thermometers sunk in the sand.

The moths ran about after emergence for several minutes before their wings began to expand, thus indicating as usual that in the natural state the species was accustomed to encounter and overcome some difficulties on first leaving the pupal shell, which would be fatal if the wings expanded at once.

One of the moths—the larger one—appeared to be normal in facies; when, however, I first saw the other—smaller specimen—in an uncertain light, I thought that the "skull" markings on the thorax were absent. Looking closely, however, it became evident that the usual markings were there, but that they were so dark in colour—of a dusky brownish tint instead of bright yellowish white—as to have become comparatively inconspicuous; otherwise the specimen did not appear to differ from the type.

I observed these interesting moths for some time alive, and the larger one, with the normal and very conspicuous "Death's-head" on the thorax, gave me a surprise. Soon after the freshly emerged insects had dried their wings and settled themselves into the position common to most moths when at rest, I approached the cage, which stood in an obscure corner, with the intention of studying the appearance of the specimens. The larger one was resting against the side of the cage, a dusky inconspicuous shape; the smaller moth was hanging on to the roof with its head towards me, and its very large eyes glowed like live coals in the half-light.

Looking closer at the grey uncertain form on the side wall of the cage, I was struck with its likeness to the hooded, long-robed figure of a mediæval monk, but with a naked, bleached skull grinning out from the hood. With my head inside the breeding-cage, I inadvertently disturbed the moth on the roof, whereupon it uttered a series of sobbing squeaks, and then it suddenly seemed to me as if the white "skull"-cap in the dark form on the side of the cage just before my face had become alive, and *was nodding out at me.* The impression in the gloom was so weird and startling that I turned my head towards the light to see if my eyes were at fault, but nothing evidently was the matter with them. Looking back at the moth, I again saw the "skull" nodding horribly, and both moths were now emitting the plaintive squeaks for which they are well known.

Nothing remained but to fetch the lamp, and to bring its light to bear on these twentieth-century spectres. Immediately, then, it became plain that the white "skull"-like disc on the thorax was movable, and now palpitating up and down rapidly,* thus being under the above conditions capable of causing the impression of a head nodding out from a dark cowl. *M. atropos* is well known as a migratory insect not indigenous in the north; and as the moths emerged in a temperature like that of their southern home, this perhaps helps to account for the remarkable exhibition they made.

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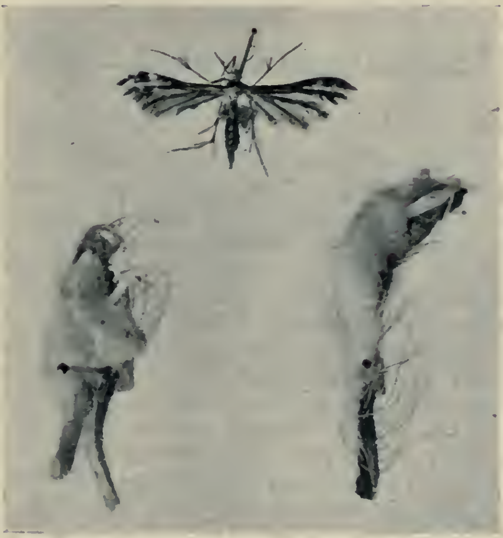
* Evidently pumping the air necessary to cause the squeaking sounds into the proboscis.

NOTE ON THE EARLY STAGES OF *OXYPTILUS PILOSELLÆ.*

BY WILLIAM PURDEY.



Oxyptilus pilosellæ, × 2; and cocoon-like pupal tenements, × 2.

ALTHOUGH repeatedly foiled in consequence of the larvæ being so extensively ichneumoned, I have, after some years, succeeded in rearing British specimens of *O. pilosellæ*. The ovum is deposited on the under side of a leaf of *Hieracium pilosella* about the end of July, and is large for the size of the moth. The general colour is pale lemon, and the larva, which hatches out in about ten days from the time that the egg is laid, is at first a miner, and eats down the midrib of the leaf. It probably hybernates quite small, but from its obscure habits I doubt if it could then be obtained in a state of nature. Neither can it be detected after hybernation until quite late in the spring, and even then only with difficulty, as it feeds in the heart of the plant among the bases of the young leaves. When approaching maturity it is a trifle over half an inch in length, of a creamy colour, with pure white hairs of an equal length with the diameter of the body, and its head is slightly tinged with brown.

At this time, about the beginning of June, the larvæ were apparently feeding, or lying dormant, preparing for the pupal change, on the under side of the leaves, and in the heart of the plant. Each larva formed a wool-like nidus, wherein it ultimately pupated about the end of June. The imagines emerged about the end of July.

There was no difference in the appearance of these bred moths and the newly caught wild specimens.

Folkestone: February, 1910.

NEW AMERICAN BEES.—IX.

By T. D. A. Cockerell.

Hoplitis mescalerium, sp. nov.

♀. Length about 9 mm., black, head and thorax with dull white hair, abdomen with conspicuous white marginal hair bands, failing more or less in the middle; ventral scopa white; clypeus very densely punctured, broadly truncate at apex, and with a median smooth line; punctures of vertex well separated; antennæ wholly dark; cheeks broad and rounded, densely punctured; under side of head with long curled hairs; mandibles tridentate, but the inner tooth very feebly developed, little more than a prominent rounded angle; maxillary palpi five jointed, joints measuring in μ (1) 68, (2) 153, (3) 136, (4) 102, (5) 76; blade of maxilla very long and slender, length about 2635 μ, but breadth near base only 100; tongue reaching to small joints of labial palpi; labial palpi with first joint about 1105 μ, second 1428, the second measured to beginning of third joint, not counting the hyaline process (170 μ) extending beyond; mesothorax shining, with the strong punctures well separated; scutellum not especially swollen; area of metathorax dull, minutely granular; pleura densely punctured; tegulæ shining black; *wings strongly infuscated*; second r. n. reaching second s. m. very near its end; apical spine on anterior tibia long; hair on inner side of hind basitarsus pale yellow; tibial spurs light ferruginous (black in *H. sambuci*); abdomen with distinct but sparse punctures.

Hab. Mescalero, New Mexico, July 12, two females (*C. M. Barber*). Named after the Mescalero Apaches, in whose territory it is found. It is closely related to *H. truncata*, Cresson, and *H. sambuci*, Titus, but separated by the dark wings, the colour of the spurs, and the measurements of the palpi. *H. adunca* of Europe, the type of *Hoplitis*, has the tongue much longer, the first joint of labial palpi much shorter in proportion to second, and the blade of maxilla not so slender.

Triepeolus denverensis, sp. nov.

♂. Length about 13 mm., black, with the *legs entirely bright ferruginous*, but the spurs of middle and hind legs black; light markings pale ochreous, as in allied species; wings only slightly darkened. Head broad; eyes (dry) pale reddish-grey; face with dense appressed white hair; labrum black; mandibles black except a little red about the middle; antennæ black; front and vertex coarsely and densely punctured; ocelli large, deep reddish; *mesothorax rather thinly covered all over with ochreous hair*, the usual two bands very faintly suggested by a greater density of the hair; *pleura densely punctured, covered with hair*, which becomes thinner below; *scutellum very strongly bigibbous*, lateral teeth strong, black, sharp, slightly curved inwards; tegulæ light ferruginous; second s. m. much narrowed above, and receiving the first r. n. in the middle; abdomen with six broad entire ochreous apical bands; black band on first segment transverse, rounded laterally, shorter than in *T. occidentalis*, connected with base of segment by a narrow band; band on second segment with a large rounded anterior lobe on each side. Related to *T. helianthi*, Robertson, but easily separated by the characters italicised.

Hab. Denver, Colorado, at flowers of *Peritoma serrulatum*, Aug. 11, 1908 (*Mrs. C. Bennett*). At the same flowers, at the same time and place, Mrs. Bennett took *Andrena argemonis*, Ckll. (both sexes), *Megachile grindeliarum*, Ckll., one female; *M. perihirta*, Ckll., three males; *Melissodes obliqua*, Say, one male (a variety with green eyes, which has also been taken at Boulder by Mr. S. A. Rohwer); and *M. agilis*, Cresson, var. b., Ckll. (Univ. of Colorado Studies, 1907, p. 255).

Megachile perihirta has a large tubercle on the inner side of the middle basitarsus near base, overlooked in the original description. I am inclined to suspect that *perihirta* and *grindeliarum* are the sexes of one species.

Ashmeadiella aridula, sp. nov.

♂. Length about 5½ mm., black, including legs, with white (not in the least yellowish) pubescence, and perfectly clear, iridescent wings. Eyes green, black in front; white hair dense on sides of face; mandibles black; flagellum dull red beneath; tegulæ rufo-testaceous; apical teeth of abdomen tipped with red, the median ones much longer than broad. Similar to *A. cactorum*, Ckll. (which occurs at Florissant, Colorado), but distinguished by the colour of the tegulæ, antennæ, and apical teeth of abdomen. It is perhaps only subspecifically distinct from *cactorum*.

Hab. Rifle, Colorado, July 3, 1908 (*S. A. Rohwer*).

I have referred to *A. prosopidis*, Ckll., two males from Boulder, Colorado (May 26, *S. A. Rohwer*), and one from Olympia, Washington State (July 1, *Kincaid*). They are not precisely typical, and the Olympia one especially is rather too large, with the wings not perfectly clear. It is probable that with more material another species might be defined, but at present I cannot find any satisfactory grounds for dividing the series.

Osmia besseyæ, sp. nov.

♀. Length 7 mm.; similar to *O. copelandica*, Ckll., except as follows: head narrower, obscurely greenish; mesothorax and scutellum dark olive green (metathorax and pleura black); hair of head and thorax above pale yellow; hind margins of abdominal segments not at all reddened. Abdomen with white hair bands, failing in the middle; ventral scopa white; wings dusky; antennæ wholly black; eyes green, blackish in front; second joint of labial palpus longer than first; basin of first abdominal segment with a short but evident transverse ridge above.

♂. Head and thorax distinctly dark greenish; hair of head and thorax above distinctly yellowish; eyes pale sage green. In the Boulder County tables (Univ. of Colorado Studies, 1907, p. 252), it runs to *O. proxima*, from which it differs by its smaller size, black abdomen with distinct hair bands and non-metallic legs. The flagellum is wholly dark.

Hab. Female (type), Boulder, Colorado, at flowers of *Besseya plantaginea*, June 1, 1908 (*S. A. Rohwer*). Male, Boulder, May 26, 1908 (*S. A. Rohwer*).

A curious little species, rather resembling an *Ashmeadiella*. It is really very much like the European *Osmia submicans*, Mar., which I have from Brindisi (*Morice*), and also from Algeria and Teneriffe. It may perhaps be found to intergrade with *O. copelandica*, but at present they appear distinct. *O. copelandica*, so far as known, flies in September.

Boulder, Colorado: Dec. 1909.

SOME NEW BUTTERFLIES FROM FORMOSA AND JAPAN.

By A. E. Wileman, F.E.S.

Sephisa taiwana, sp. nov.

Male. Fore wings fulvous with three black spots of irregular shape on the costal area, the first extends to just below the middle of the cell, the second to the second median nervule, and the third to the third median nervule; a large black patch on the inner marginal area extends from the base to just beyond the middle of the wing; the black, wavy, submarginal line increases in width from the middle to the costa, and is separated from the black marginal line by a series of fulvous lunules; the space between the second costal spot and the submarginal band is broken up by the broadly black nervules into three small spots. Hind wings fulvous, rather paler on the discal area; a black bar about the middle of the costa and a round black spot below it; two small black spots in the cell, that nearest the base obscure; the black markings on the outer marginal area somewhat similar to those on the same area of the fore wings, but the submarginal line is preceded by a black ring and cloud and some blackish spots, and brownish clouding between these and the costa; the abdominal fold is greyish, and the adjoining interspace is clothed with black and fulvous hairs. Under side of the fore wings fulvous, with black markings as above but smaller, the middle spot on costal area divided into three parts, the largest of these enclosing a pale dot; two whitish spots on the outer edge of the third costal spot; the lunules before the marginal line merge into whitish towards the costa. Hind wings silvery white, with a network pattern in black above the cell towards base; two black spots in the cell; beyond the middle there are two black, wavy lines, with the space between them filled in with fulvous, and enclosing a black ring in the first and a black spot in the second median interspaces. Expanse, 70 millim.

One male specimen from Lalachi, June 1st, 1908, 4000 ft.

Orthomiella rantaizana, sp. nov.

Male. Upper side sooty black, the costal half of hind wings purplish with a metallic sheen, but this colour hardly extends to the outer margin. Under side brownish, sprinkled with bluish-grey scales over the discal area, but most in evidence on the basal area of each wing; on the fore wings there is a spot in the cell, one at the outer end of the cell, and a rather curved, transverse, macular band beyond; all these markings are but slightly darker than the general colour, and are very indistinct; the hind wings have two irregular dusky bands, the basal one finely edged outwardly with lilacine; a series of dusky marks on the outer margin, those nearest the anal angle black and most distinct. Expanse, 27 millim.

Hab. Formosa.

Male type from Rantaizan, Formosa, 6000 ft. Two male specimens from Rantaizan, May 4th, 1909, and May 14th, 1909.

This species is near *O. pontis*, Elwes, and *O. sinensis*, Elwes.

Apatura ilia ab. *mikuni* ab. nov.

Male. On the upper side this insect very closely resembles the same sex of *A. iris*, but the general colour is browner, the three subcostal white spots of the fore wings are larger, and almost confluent; there are four black spots in the cell, and the black spot on the outer marginal area is ringed with fulvous. The white band on the hind wings is narrower and very irregular; the black spot in the first median interspace is fulvous ringed, and there is a fulvous dot above it; the interrupted submarginal band is also fulvous. Under surface of all the wings strongly suffused with tawny, the markings pretty much as above, except that the black spot in first median interspace is reduced to a mere dot, and the dot above it is white; the outer marginal area has a double series of more or less confluent, lilacine lunules, except towards the apex of the fore wings. Expanse, 80 millim.

Hab. Japan. One male specimen from Mikuni, Province of Bungo, June, 1896.

Possibly a dimorphic form of *A. ilia* var. *substituta*, Butler.

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By Claude Morley, F.Z.S., F.E.S.

(Continued from p. 64.)

68. *Kermes ilicis*, Linn.*

No one has recorded parasites from this species since Fonscolombe gave his account (Ann. Soc. France, 1832, p. 297, quoted by Nees, ii. 427): "E. *cocco Ilicis* tinctoriæ, Junio mense, quo tempore colligitur, observante D. Fontanier, occitano."

69. *Asterodiaspis variolosum*, Ratz.

Habrolepis (*Encyrtus*) *dalmanni*, Westw. (*nubilipennis*, Walk.) has been bred from the synonymous *Lecanium quercicola*, Bché., both in Europe (Wachtl, Wien Ent. Zeit. 1882, p. 298) and America (Ashmead, 1900, p. 404).

70. Dactylopius.

Several parasites are said by Ashmead (1900) to have emerged from unknown species of this genus. These are:—eleven *Coccophoctonus dactylopii*, Ashm., of both sexes, bred in Australia in Sept. 1894 by Albert Koebele (p. 375); *Aphycus angelicus*, How., bred from a species on passion flower in N. America, and *A. australiensis*, How., bred in Australia from another on eucalyptus (p. 384); *Tetracnemoidea australiensis*, How., from a species on *Pittsporum* (p. 357); *Aphycus nigritus*, How., bred in California from a species on *Artemisia* (p. 387); and *Chrysoplatycerus splendens*, How., from a species from the same locality.

71. *Dactylopius destructor*, Comst.*

From this pest have been raised *Coccophagus flavoscutellum*, Ashm. (Revis. Aphel. N. Amer. 1895, p. 36); *Chiloneurus dactylopii*, How. (Descr. N. Amer. Chal. 1885, p. 17); *Encyrtus inquisitor*, How. (Report Ent. U. S. Agric. 1881, p. 367); *Leptomastix dactolopii*, How. (Descr. p. 23). *E. inquisitor* is placed in the genus *Zarhopalus* by Ashmead (1900, p. 406).

72. *Dactylopius ephedræ*, Coquil.*

Signiphora dactylopii, Ashm., is recorded from this species by its author in Northern America (Ashm. 1900, p. 410).

73. *Dactylopius vastator*, Mask.*

In Hongkong *Aphycus dactylopii*, How., has been raised from this species (*l. c.* p. 385).

74. *Dactylopius virgatus*, Ckll.*

Ashmead tells us (*l. c.* p. 373) that *Blepyrus texanus*, How., has been bred in Texas from this species, together with (p. 388) *Aphycus texanus*, How.

75. *Dactylopius longispinus*, Targ.

Two species, *Coccophagus orientalis* (Proc. U. S. Nat. Mus. 1896, p. 633) in Ceylon, and *Eucomys* (*Encyrtus*) *albicoxa*, Ashm. (Trans. Amer. Ent. Soc. 1885, Proc. p. xvi.) from N. America, have been recorded from the synonymous *D. adonidum*, Targ., the "Mealy Bug."

76. PSEUDOCOCCUS.

Newstead says (Mon. Coccid. i. 32) that he has bred *Aphycus Pappus*, Walk., freely from uninstanced species of the genus at Weston-super-Mare, Norfolk, and Cheshire: that it was, in fact, often difficult to find an unaffected female; and Howard tells him that he bred a specimen of the Proctotrypid *Lygocerus hyalinatus*, Thoms., from (probably some dipterous larva in) *Pseudococcus*.

77. *Pseudococcus yuccæ*, Coquil.*

Perissopterus mexicanus, How. (Revis. p. 22) in Mexico, and *Blastothrix yuccæ*, Coquil. (Ashm. 1900, p. 390) from California, prey upon this species.

78. *Pseudococcus aceris*, Sign.

The omnivorus *Coccophagus lecanii*, Smith (Revis. p. 33), *Rhopus* (*Acerophagus*) *coccois*, E. A. Smith (North. Amer. Entom. 1880, p. 84), have been recorded from this species. [For reference to this species' association with ants, *cf.* Ent. Month. Mag., May, 1892, pp. 60 et 307, and 1894, p. 87.]

79. RIPERSIA.

Two Chalcids, one belonging to the genus *Cerchysius* and the other to an apparently new genus, not far from the curious hemipterous *Dinocarsis*, Först, have been bred from this genus by Newstead (Mon. Brit. Coccid. i. 32).

80. *Eriococcus azaleae*, Comst.*

Howard records his *Coccophagus immaculatus* (Report Ent. 1881, p. 358) from this species.

81. *Eriococcus rhodomyrti*, Green.*

Encyrtus (*Adelencyrtus*) *solidus*, How. (Proc. U. S. Nat. Mus. 1896, p. 638) is given as bred from this host by Howard and Ashmead (1900, p. 402), in Ceylon.

82. COCCUS.

I have been enabled to refer all the species of *Coccus* (*sensu lato*) from which Hymenoptera have been bred to their restricted genera, except the following four kinds, some of which are probably synonymous with others already cited. This method is, however, of course impossible when the Coccus-host has been referred in the first instance to no particular species or food-plant, and I must briefly summarize here parasites simply given as raised from *Coccus*. Ratzeburg (Ichn. d. Forst. ii. 145) says *Encyrtus æneus*—or *E. melanopterus*, Nees—was bred by Reissig from female *Coccus* on the stem and branches of blackthorn in July, 1843; that the three females of his *Telegraphus maculipennis* (ii. 153) which he described were bred with the above parasite from female *Coccus*, and suggests that *Encyrtus mirabilicornis* is also a Coccus-dweller—*Cerapterocerus mirabilis*, West., is stated by Dalla Torre to have been bred from *Coccus* by Dr. Giraud; of *Bracon breviusculus*, Ratzeburg says (*l. c.* iii. 37) that this specimen is interesting because it had an unheard-of host for a Braconid, viz. *Coccus* on oak-bark; he also instances (i. 200 et 201) *Pteromalus xanthopterus*, *P. microneurus* and *P. maculipes* as also probably bred from *Coccus*. Costa bred his Eucharid *Aspidocoris cyanea* (Bull. Ac. Nat. Napoli, 1863, p. 24) from species of *Coccus* on *Citrus*, *Myrtus*, and *Ficus*. Mayr raised *Eusemion* (*Cerapterocerus*) *cornigerum*, Walk. (Verh. z.-b. Ges. 1875, p. 749) from *Coccus* in Austria; this is quoted by Gaulle (Cat. 100), who adds the extremely doubtful record hence of the Cynipid *Allotria rubriceps*, Kieff., probably upon its author's authority.

(To be continued.)

NOTES AND OBSERVATIONS.

We are pleased to note in the list of candidates proposed for election to the Royal Society the name of Dr. F. A. Dixey, M.A., M.D., Bursar of Wadham College, Oxford, and President of the Entomological Society of London. Dr. Dixey has made the Pierine group of butterflies his own especial study, and those of us who were fortunate enough to hear his Presidential Address this year on the "Plume-scales of the Pierinæ" have already had an opportunity to estimate the great value to science of what may be described as his "diploma" work. Dr. Dixey, however, did not deliver the whole of his paper of the occasion of the Annual Meeting. But it will appear *in extenso* in part v. of the Society's publications for 1909, and will be illustrated by three plates—a unique addition to the Addresses published in previous years. Meanwhile we offer our sincerest congratulations to Dr. Dixey, who now joins the select band of Royal Society Fellows who are also entomologists.

Ocystola æthopis, Meyr., in Devonshire.—I have to record the occurrence of this Australian moth in South Devon in September, 1908. I received the specimen, with others, in the autumn of that year from the captor, the Rev. J. W. Metcalfe, of Ottery St. Mary, who does not collect Tineina. It was first of all submitted to Mr. E. A. Atmore, F.E.S., who said that he had nothing like it, and could not suggest a name. After lying for some months in my box I was able to find time to forward it to Mr. Edward Meyrick, F.E.S., who wrote me on November 14th, 1909, stating that it "is an Australian insect (*Ocystola æthopis*, Meyr.), described by myself in the 'Transactions' of the Royal Society of South Australia for 1902, p. 136. I have described about forty species of the genus *Ocystola*, which belongs to the Œcophoridæ, and is exclusively Australian, so far as known. The occurrence of this species is very curious, but it must be undoubtedly due to accidental importation with its food-plant. *O. æthopis* is found under temperate conditions in Victoria; its larval habits are unknown, but some closely allied species of the genus are attached to *Eucalyptus*, the larva feeding on the leaves in a curious and unusual form of portable case, consisting of a short length of woody twig bored down the centre; it is very probable that *O. æthopis* also feeds on *Eucalyptus* in the same way. You say this specimen came from a correspondent in Devonshire; in the Devonshire climate the hardier species of *Eucalyptus* grow well in the open air. Perhaps you will kindly ask your correspondent for particulars of capture, and whether he has any *Eucalyptus* growing in the neighbourhood, or, failing that, since the hard larval case containing the pupæ could easily be imported with anything from Australia, whether he can account for its introduction by any communication coming directly or indirectly thence." As suggested, I wrote to the Rev. Metcalfe, who replied that he believed he took the moth in September, 1908, at Harpford Wood, near Ottery St. Mary, but that so far as he knew there was no *Eucalyptus* in the neighbourhood. — C. GLANVILLE CLUTTERBUCK, F.E.S., Heathville Road, Gloucester, Feb. 3rd, 1910.

EARLY COPULATION OF NOTONECTA.—I was surprised to find, on January 14th, several pairs of *N. glauca* var. *maculata* in cop. in a small pond near Winscombe, Somerset, especially as, though it was very mild, on the previous day the same pond was covered with a thin sheet of ice. — OSCAR WHITTAKER; "Overstrand," Lancaster Road, Birkdale, Jan. 17th, 1910.

AQUATIC HEMIPTERA.—I am working on the Aquatic Hemiptera, and should be greatly indebted to anyone who has any specimens of the following to spare if he would kindly let me have them. I am more especially in want of males, the species I require being *A. æstivalis*, *M. scholtzii*, *M. minutissima*, *Corixa lugubris*, *selecta*, *limitata*, *venusta*, *sodalis*, *caledonica*, *carinata*, *germari*, *cavifrons*, *bondsdorffii*, and *coleoptrata*.—OSCAR WHITTAKER.

AN ENTOMOLOGICAL MICROSCOPE.—The Zeiss-Greenhough stereoscopic binocular microscope is the best I know of for entomological purposes. Its great peculiarity is that it is a true binocular, the object viewed being seen with a pair of objectives so arranged that the natural "standing-up" of the object is somewhat increased. This microscope is not suited for histological purposes, as its magnification is limited to about 72. A complete equipment consists, in addition to the stand, of four pairs of eye-pieces and four paired objectives, hence sixteen different magnifications are obtained. This is a greater variety than is necessary, and anyone starting may limit himself to the stand, to the No. 1 or No. 2 eye-piece, and to the *a* 2 objectives. Other powers may be obtained subsequently. The combinations mentioned give a magnification of only 20 or 24; of course any other combination may be selected as a start, the magnifications varying from 8 to 65. This microscope requires a good light, especially with the higher powers, and particularly with the more powerful oculars. The pleasure of entomological work is greatly enhanced by the possession of one of these microscopes.—D. SHARP.

A MEETING of the Entomological Club was held in the "Gordon Room" of the Holborn Restaurant on February 1st, 1910. Mr. G. H. Verrall, M.P., was in the chair.

Other members present were: Messrs. Adkin (R.), Donisthorpe, Hall (T. W.), Porritt, and Rowland-Brown.

Including the Honorary Members—Messrs. Jones (A. H.), Sich, and Smith (E. A.)—there were seventy visitors.

A MEETING of the Entomological Club was also held at 58, Kensington Mansions, South Kensington, on February 22nd, 1910. Mr. Horace Donisthorpe in the chair.

Other members present were: Messrs. Adkin (R.), Rowland-Brown, Verrall. Mr. A. H. Jones (Hon. Member) and thirteen other visitors attended.

CAPTURES AND FIELD REPORTS.

NEMOBIUS SYLVESTRIS (ORTHOPTERA). — Mr. G. T. Lyle sent me from the New Forest three specimens of the wood-cricket, which he took on February 12th crawling and hopping about on fallen sweet-chestnut leaves. Two were immature, but the third was a female apparently quite full-grown. I was surprised to see a full-grown individual in the winter.—W. J. LUCAS.

TÆNIOCAMPA OPIMA AND HIPOCRITA JACOBÆÆ, AB. IN BERKS.— It may be of interest to record the capture of *Tæniocampa opima* (grey form) at light on April 24th, 1909, and of a yellow variety of *Hipocrita* (*Euchelia*) *jacobææ* in June, 1909.—H. S. RUTLAND; Letcombe Bassett, Wantage, Berks.

VANESSA IO IN JANUARY.—On January 2nd of this year my father was walking along a street, and saw a specimen of *Vanessa io* fly to and rest upon a window. I think this is a record. — S. JONES; "Waimea," West Heath Road, King's Norton, Worcestershire.

ORTHOLITHA CERVINATA AND POLIA FLAVICINCTA IN EPPING FOREST. —My collecting in and around Epping Forest last year has yielded two species which during my four years' collecting in this district I have not before had the good fortune to capture; they are *Ortholitha cervinata* and *Polia flavicincta*. *O. cervinata* I found in the larva stage feeding on hollyhock in the garden of an empty house in Chingford about the middle of May, and *P. flavicincta* came to sugar on September 24th. I should feel greatly interested to hear from your readers what the last record is for either of these insects with regard to Epping Forest.—R. T. BAUMANN; "Glendale," 17, Station Road, Chingford, Essex.

EPIONE APICIARIA IN AUTUMN.—Referring to your correspondent's note (*ante* p. 66), I may mention that I took a very fair specimen of this moth on a gas-lamp in Lewes on the 1st November last. The insect appeared hardly in keeping with such species as *P. populi*, *A. sphinx*, *H. defoliaria* and *H. aurantiaria*, which were obtained at the lamps the same evening.—HUGH J. VINALL; "Torbay," Park Road, Lewes.

AUGUST IN THE VALAIS AND VAUD CANTONS.—When I found it possible this year, for the first time, to spend a month in Switzerland, I determined to get expert advice as to the most promising localities, and from a number of good places most kindly suggested to me by the Rev. G. Wheeler and Mr. J. W. Tutt, I finally elected to spend the first three weeks on the Col de la Forclaz, between Martigny and Chamonix, and the last week on Mont Pélerin, just above Vevey. Travelling *via* Newhaven and Dieppe, we spent the night in the train, and our first sight of Switzerland could scarcely have been a more impressive one, as we came within view of Lake Leman with Mont Blanc in the distance, in the glorious haze of a brilliant summer morning on July 31st. Passing the towns on the north side of the lake, we entered the Rhone Valley, and arrived at Martigny, the end of our railway journey, at 9.30, to find a carriage waiting to take us up the three hours' climb to the Col de la Forclaz. We had not proceeded far from the town and suburb before we began to see butterflies of many kinds in plenty around us, including *Parnassius apollo*, *Leptosia sinapis*, *Dryas paphia*, *Argynnis aglaia*, *Melitæa athalia*, *M. dictynna*, *Pararge mæra*, *Erebia stygne*, *E. tyndarus*, *Melanargia galatea*, and many others, besides several fine *Callimorpha hera*. We arrived at the hotel about one o'clock, and after a hearty meal we unpacked our nets and went down the road to try and take some of the insects we had seen in the morning, and besides those mentioned above we took *Chrysophanus alciphron* var. *gordius*, in splendid condition. The next day we devoted to an exploration of the Valley and Glacier du Trient, in the former of which they were already beginning to cut the hay, so we determined to make the most of the next few days there, before attempting any of the higher ground around us. This locality yielded us splendid bags on each occasion that we visited it, amongst the new things being *Carcharodus althææ*, *Pamphila comma*, *Carterocephalus palæmon*, *Chrysophanus virgaureæ*, *C. hippothoë*, *Lycæna arion* (very much worn), *Cupido minima*, *Nomiades semiargus*, *Polyommatus damon*, *P. hylas*, *P. alexis*, *P. astrarche*, *Papilio machaon*, *Parnassius delius* (worn), *Aporia cratægi*, *Colias phicomene*, *Brenthis amathusia*, *Cænonympha satyrion*, *Erebia melampus*, *E. manto*, *E. euryale*, *E. ligea*, *E. pronoë*, and *E. tyndarus*, as well as *Zygæna minos*, *Setina aurita* var. *ramosa*, a fine specimen of *Plusia bractea*, *Acidalia trilineata*, *Larentia lugubrata*, *L. tristata*, *L. hastata*, and *Odezia atrata*; and on a subsequent occasion we took *Parnassius mnemosyne* and *Polygonia c-album*, on the road between Forclaz and the village of Trient.

We were fortunate in finding an enthusiastic entomologist, Mr. George Flemwell, living at the hotel, and as he has been collecting in the neighbourhood of Forclaz for many years, his experience was very useful, and he generously put at our disposal several of his books, which were enriched by his own coloured drawings and notes.

On the afternoon of August 3rd, after a wet morning, we climbed up the zigzag path to the top of Arpille, which is about two thousand feet higher than the Forclaz. The view from the summit, towards the Bernese Oberland on the one side and towards the Mont Blanc range on the other, is magnificent, and it was especially fine on the day in question, owing to the rapidly changing effects of cloud and mist. On the way up we captured several specimens of *Papilio machaon*, and a fine female *Argynnis niobe*, together with *Zygæna lonicerœ*, *Setina aurita*, *Gnophos obfuscaria*, *Nemoria viridata*, *Cleogene lutearia*, and *Thera juniperata*; and among the rhododendrons on the summit we were rewarded with a fine series of *Colias palæno*, and a good number of *Hesperia alveus*, *Polyommatus donzelii*, *P. optilete*, *Brenthis dia*, *B. pales*, *Erebia pharte*, *E. stygne*, and *E. æthiops*; and we paid another visit to this spot three days afterwards, to extend our series of these species. By Mr. Flemwell's advice we went to Martigny on August 7th, and took the train to Sion. During the walk down we captured *Thymelicus lineola*, *Melitæa didyma*, and *Aglaïs urticæ*, along the roadside, and two fine specimens of *Papilio podalirius* were netted in a vineyard near Martigny Bourg. It was a very hot day, and on reaching Sion, soon after midday, we toiled up to the Castle of Tourbillon, where we were glad to find a little shade. On a plateau outside the walls we took some more *Papilio podalirius*, as well as one or two worn *Satyrus hermione*, and some fine *S. cordula*, the males of which look very brilliant in the sunshine. *Dryas paphia* was also common here, and *Callimorpha hera* was observed between the castle and the town.

A day spent on the Col de Balme, whence one gets a very fine view of Mont Blanc and the Valley of Chamonix, yielded little that was new except *Erebia lappona*, but on Bovine, and along the Valley of the Durnand to the prettily situated village of Champex we took some more *Polyommatus donzelii* and *P. optilete*, and the pretty little *Psodos quadrifolia*.

On August 11th we went to Châtelard, on the frontier between Switzerland and Savoy. On the road through Trient and round the Tête Noire we took a number of Erebias, with which we were now beginning to be familiar, and observed that *Parnassius apollo* was very plentiful; but immediately after crossing the bridge over the torrent where the road turns off towards Finhaut we came upon a patch of thistles and other wild flowers by the riverside which was literally alive with butterflies and moths. No fewer than thirty-two species of the former and seven of the latter were taken during the busy half-hour which we devoted to this spot, and the new ones were *Chrysophanus dorilis* var. *subalpina*, *Thecla spini*, *Anthocharis simplonia*, *Colias hyale*, *Argynnis adippe*, *Issoria lathonia*, *Brenthis euphrosyne*, *Vanessa io*, *Epinephele jurtina*, and *E. lycaon*; *Zygæna hippocrepidis*, *Lithosia lurideola*, *Parasemia russula*, and *Selidosoma glabraria*. But by far the most interesting insect taken at this spot was a magnificent variety of *Argynnis aglaia*, with the dark markings very much increased, and approaching fig. 5 on plate 61 in Mr. South's 'Butterflies of the British Isles.' Many visits were made to this spot, and on every occasion the same profusion of insects was observed. On Saturday, August 14th, another brilliantly fine day, we walked to Chamonix by way of Trient, Châtelard, Barberine (where we diverged from the main road to see the Cascade), and Argentière, over the low Col des Montets. Nothing new was noticed, but a fine specimen of *Papilio machaon* was taken as it settled in the dust of the road, and some good examples of *Chrysophanus dorilis* var. *subalpina* were captured. Chamonix itself was almost unbearably hot, and the glare of the sunlight on the snow was rather trying. We walked back through Argentière and over the Col de Balme, thus having accomplished a walk which would have been quite impossible in our English climate. Our last long expedition from Forclaz was to Finhaut, *via* the Tête Noire and Châtelard, but, entomologically speaking, this was a disappointing day compared with others, though we got some good *Nomiades semiargus* and another *Polyommatus donzelii*, and saw *Chrysophanus phlæas*, the only one observed during our whole visit. On Friday, August 20th, we reluctantly left the Forclaz, and on the road to Martigny we took a few more *Callimorpha hera*, which was very plentiful, and a few *Pyrameis atalanta*. We also out of curiosity annexed a specimen of a large green Locustid and of the red-winged grasshopper, *Œdipoda fasciata*, which is so well concealed by the colour of its elytra as it settles on the rocks. We arrived at Chardonne, a village half-way up the funicular railway between Vevey and Beaumaroche, in time for dinner, and found that our new quarters contained a terrace overlooking the lake. We spent a considerable portion of our week here in studying this view, which we saw in brilliant sunlight and in gloom, by moonlight and at sunrise; at sunset, with the promise of a fine morrow, and at sunset-time when there was no sun to be seen. The fine outline of the Dent du Midi was sometimes visible and sometimes completely hidden, and the waters of the lake took their hues from the sky and mountains above them.

On August 23rd we took out our nets and explored Mont Pélerin and its vicinity, the most interesting captures being *Colias hyale*, *Euvanessa antiopa*, and *Chrysophanus dorilis*. *E. antiopa* had settled in the road among some fallen leaves under a tree, and we should have passed it by unnoticed had it not suddenly opened its wings. An interesting walk through the vineyards, where the green lizards kept peeping up at us from the hot walls, led us to the pretty village of Chexbres, where we took *Zephyrus betulæ*, *Pararge megæra*, *Hipparchia semele*, and a single *Cœnonympha pamphilus*, as well as *Euclidia glyphica* and *Larentia tophaceata*. In the house at Chardonne we found *Bryophila perla*, *Plusia moneta*, *Eois rusticata*, and *Phibalapteryx vitalbata*, but all through our visit we did not go out of our way to get any moths, only taking those that turned up.

On August 27th we left Switzerland for Paris and home, and our eventful month was at an end. During that time we took seventy-five species of butterflies and twenty-six species of moths.—F. A. OLDAKER, M.A.; Haslemere, December 3rd, 1909.

RECENT LITERATURE.

Études de Lépidoptérologie Comparée, fasc. iii. CHARLES OBERTHÜR. Rennes: June, 1909.

WE have received from Rennes the third part of M. Charles Oberthür's "Études de Lépidoptérologie Comparée," an ample volume of 415 pages, illustrated by no fewer than twenty-five coloured plates, and divided up into five separate papers, of which by far the most interesting to British readers will be the last, "Notes pour servir à établir la Faune Française, et Algerienne des Lépidoptères." For this paper is in fact the beginning of the first comprehensive work on the Butterflies of France since the time of Berce—a sufficiently long interval filled up for the most part by authors who have busied themselves with repeating the observations, and not a few of the errors, of their predecessors of the middle-nineteenth century. So far as we are aware, it is also the first attempt made by a French naturalist of the highest authority to summarize and explain the existence and meaning, the limitations and possibilities of variation in the many species brought under his own personal notice. Since not the least merit of these "Études" consists in their being the individual work of a scientist who, having unrivalled opportunities of forming a collection without peer among the private collections of the world, has turned his advantages to the use of the student.

M. Oberthür may not hold the same views of species, nor employ a nomenclature more advanced than that of Staudinger, but he justifies his arrangement by repeated references to the earliest authorities. Nor is the work such a one as commends itself to the advanced entomologist alone. Written with the ease and charm which seem to flourish more naturally in literary France than in England, M. Oberthür delights to tarry in the flowery Breton bypaths, or in the splendid solitudes of the Pyrenees—his own particular happy hunting-grounds—to discourse upon the rare virtues and fellowship of the many lepidopterists with whom he has taken the field, from Guenée onward; or to paint a charming word-picture of pastures and uplands wholly beyond the ken of our most enthusiastic butterfly hunters. His vision of Angoulême, on the threshold of the Midi, in the transparent sunshine of a still summer morning; the tender references to the father who first kindled in him the love of Nature; the grateful optimism which has preserved his affection for men and winged things alike, fresh and untainted—all contribute to make these studies the more enchanting, without depreciating in the least their scientific value. To those deeply interested, as the writer of this notice, in the distribution of the Lepidoptera of Western Europe, and often seeking in vain for accurate and reliable information, they are a mine of wealth. For, although there are innumerable Catalogues of many departments in existence from Duponchel and Donzel to M. de Johannis*—that is, from the beginning of French entomology to the last year of the French Entomological Society's publications—M. Oberthür limits his localities almost exclusively to those with which he is himself familiar, or those investigated by his distinguished brother, M. René Oberthür, and the several friends and professional collectors whose captures adorn his collection, and whose identifications are above the suspicion not seldom inspired by the published lists of our own as well as of French writers. Thus avoiding needless repetition of descriptive matter in dealing with the typical insect, M. Oberthür devotes the greater part of each notice to discussing local races, varieties, and aberrations, in many instances reproduced with exquisite fidelity in the accompanying coloured plates. Of these, perhaps the most successful are those depicting the variation of *Satyrus fauna*, Sulz. (= *statilinus*, Hufn.), from France and other countries, with its near allies in Algeria; the two devoted to aberrations of Papilionidæ; and, best of all, the fine representation of ten forms of *Melitæa didyma*—decidedly the least convincing of "British" butterflies! Forms of the Zygænidæ also figure largely, and, as with the Lycænid plates, we can only hope that the blues and reds of modern "process" will wear better than those employed by the hand-painters whose often magnificent work, so far as the pigments are concerned, has not survived the ordeal of time. Lastly, we are certain that the issue of this section of the "Études," when complete as regards the French and Algerian butterflies, is sure to receive in book-form a warm welcome from the growing number of students of Palæarctic Lepidoptera on this side of the Channel.

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* "Contribution à l'Étude des Lépidoptères du Morbihan," par J. de Johannis, Ann. Ent. Soc. Fr. 1908, pp. 689–868, a work of special value as a guide to the Micro-Lepidoptera of the Department, but containing some truly remarkable records of species among the butterflies, and the time of their appearance!

H. R.-B.

OBITUARY.

Edward Saunders, F.R.S., F.L.S., F.E.S.—We sincerely regret to hear of the death, on February 6th last, of this eminent entomologist. Although he wrote upon Buprestidæ and described many new species in this family of the Coleoptera, he was more widely and better known as an authority on Hymenoptera and Hemiptera.

In the first volume of the 'Entomologist's Monthly Magazine' (1864) there is a note from his pen on Coleoptera near Lowestoft (p. 75); and in 1880 he, together with the late Mr. C. G. Barrett, joined the editorial association of that magazine.

Among his separate publications are:—'A Synopsis of British Hemiptera-Heteroptera' (1876); 'Catalogue of British Hemiptera-Heteroptera' (1876 and 1890); 'Catalogue of British Hymenoptera' (1890); 'Hemiptera-Heteroptera of the British Islands,' with thirty-two coloured plates (1892); Hymenoptera Aculeata of the British Islands,' with forty-nine coloured plates (1896); and 'Wild Bees, Wasps, and Ants,' with four coloured plates.

With very great regret we have to record the death, on February 8th last, of Mr. Harry McArthur, aged 54 years.

He was the son of the late Mr. Niel McArthur who during the greater portion of a long life had, in his spare time, been a collector of British Lepidoptera and had acquired a considerable knowledge of the species occurring in the Brighton district and surrounding country. From early youth the son took an active interest in Nature study with a special leaning to entomology. He soon became as expert as his father in field-work, and thus to a large extent was prepared for undertaking the more arduous labours he afterwards accomplished.

In the year 1880 young McArthur was engaged by Mr. Meek to collect lepidoptera in the Shetland Isles. This trip was so successful that in the following year he again visited the Shetlands and then added thirteen species to the list of fifty-three he had previously obtained. In 1883 he once more journeyed to the Shetlands, but on this occasion Unst, the most northern isle of the group, was the scene of his operations. Among the half-dozen additional species he secured was *Crymodes* (*Hadena*) *exulis*. The Outer Hebrides next attracted his attention, and in 1887 he spent the entomological season of that year in the Isle of Lewis. As he added some seventy odd species to the list of lepidoptera known to occur in that island, this venture seems to have been highly successful, although he had a severe illness whilst there.

In 1888 and 1889 he collected in Kashmir for the late John Henry Leech, Esq. Travelling through Lahaul and Ladak up to the Karakoram, he probably worked a good deal of country that had never been visited by an entomologist before. The winter of 1888–89 he spent in the Malay Peninsula. The difficulties attending him during the Kashmir journeys were great, but the fact that he, in spite of all obstacles and endless trouble with natives, coolies and others, attained his object, shows him to have been a man resolute in the performance of whatever he undertook. A large number of insects, chiefly moths, were captured, and many specimens of previously described, but rare, species were obtained.

In 1892 he visited the Shetlands for the fourth time, and in the following year he had a season in Co. Cork, Ireland. Collecting in Orkney during the season of 1895 he added seventeen species to the list of Orkney lepidoptera; and four months spent in the Isle of Lewis, in the year 1901, increased the number of species of lepidoptera known to occur in that island by seventeen species also. His last entomological expedition (1908) was to Aviemore, and here the initial stage of his fatal illness seems to have attacked him, but he would not give in, and even made an expedition to Harris in June, where, however, he was unable to obtain access to suitable collecting ground. On his way back to Aviemore he spent a few days in a reputed locality for *Zygæna achilleæ*, but as he could not obtain this species, or find a shelter for himself, he had to leave the inhospitable district. After his return to London he appeared to be in his usual health for a time, but subsequently he broke down and in May, 1909, he went into hospital, as it was found that he was suffering from cancer.

We also regret to announce the decease, at an advanced age, of Albert Piffard, Esq., F.E.S., &c., of Felden, Boxmoor, Herts.

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CHIASTOPSYLLA, A NEW GENUS OF SIPHONAPTERA.

BY THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S., F.E.S.

IN a small pamphlet on rat-fleas which we are going to publish for the use of those who study the transmission of disease through the agency of fleas we had to mention a small group of South African species which were originally described as *Ceratophyllus*, but really constitute a genus apart. As the pamphlet in question is not a place suitable, in our opinion, for the publication of new names, we give here a description of the genus, which we propose calling :

CHIASTOPSYLLA, nov. gen.

Allied to *Ceratophyllus*, but characterized by the following particulars :—The labial palpi consist of four segments. The eye is well developed, but not strongly pigmented. The genal edge of the head bears two spines, one lying on top of the other. The pronotum has a comb of about twelve spines. The seventh abdominal tergite bears one long apical bristle on each side. The eighth sternite is small in both sexes. The hind coxa has a comb of spines on the inside. The mid and hind femora bear no lateral row of bristles. The fifth segment has in all the tarsi four lateral bristles, besides a thin subapical hair, there being no ventral bristles in between the proximal pair.

Type : *C. numæ*, Rothsch., Nov. Zool. p. 637, n. 27, pl. xii. fig. 58, pl. xiii. figs. 59, 63, 65 (1904).

Other species :—

C. octavii, Rothsch., *l. c.* p. 638, n. 28, pl. xiii. fig. 61 (1904).
C. rossi, Waterst., E.M.M. ii. p. 271, n. 547, pl. v. figs. 3, 4 (1909).

CONCERNING THE FERTILIZATION OF *ORCHIS MACULATA.*

By A. M. Stewart.

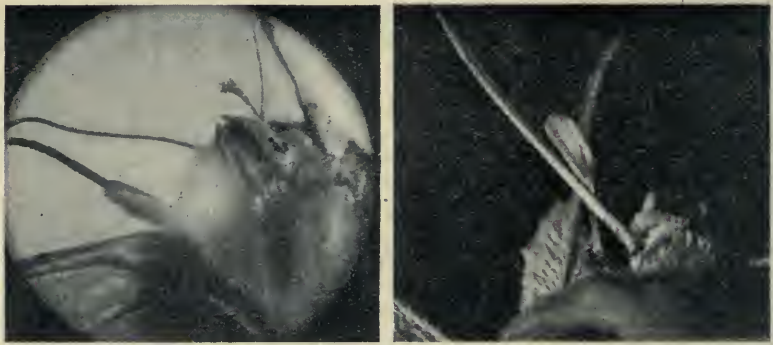

Fig. 1. Fig. 2.

Pollinium on head of *Plusia festucæ* and *Cucullia umbratica.*

Prof. Meldola's note on "*Cucullia umbratica*, a Fertilizer of *Orchis maculata*" (Entom. xlii. p. 281), draws attention to a subject of very great interest and some importance. It has been the custom hitherto to regard the bees as the great fertilizing agency at work amongst the flowers. Their labours are carried on in the sunshine, and are therefore seen and noted.

Thirty years of moth-collecting in the dusk of summer evenings, combined with a fair share of knowledge regarding the 'Ways of our Wild Flowers,' have led me to somewhat modify that conclusion. I was always fond of collecting the Plusias; they are the trout of the entomological angler, so warily have they to be stalked in the failing light as they speed from flower to flower.

It must have been many years ago—possibly twenty—when I first took *P. festucæ* with the pollinium of *O. maculata* fixed on its head.

I know a rough hillside some miles from here where the spotted orchis is a much commoner plant than the ragged robin (*Lychnis flos-cuculi*), which latter is the flower most frequented by the Plusias in this district.

At varying intervals I have noticed a specimen amongst my captures with these extra "decorations," but on looking over my series I find that only two remain with me.

If a careful watch be kept in the future by those interested, not only over the species of *Plusia* but also over those of *Dianthœcia* and *Cucullia*, there is no doubt that some new records and facts will come to light.

In the illustration (Fig. 1), which is greatly magnified, the sticky disc at the base of the filament is very clearly brought out, although the pollen mass or anther at the other end is somewhat frayed.

The moth is one of the specimens of *P. festucæ* previously mentioned, and the photograph has been taken from the under side of the head.

[Figure 2 is from a photograph (× 10) taken by Mr. F. Noad Clark, showing the pollen mass on the head of *Cucullia umbratica*. We are indebted to Professor Meldola for the loan of the specimen.—Ed.]

38, Ferguslie, Paisley.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 83.)

The range of variation in *aurelia* is, so far as my experience goes, less than in any of the other species as yet considered. The form of the plains is decidedly lighter than that of the mountains in general appearance, though occasionally the hind wings, even in the former case, show an inclination to melanism, reminding one of the hind wings of *dictynna*. It is stated by Kane, following some of the German writers, that *aurelia* is a larger and finer insect in Germany than in Switzerland. This statement I cannot help thinking is mainly due to a general uncertainty obtaining amongst German authors as to what is or is not *aurelia*. It is only lately that I have come across Gillmer's paper in the 'Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg,' vol. lix. pp. 59, &c., which is the first that I have met with which seems to display any grip of the matter, though I am far from asserting that I have searched all the local German publications, and may have missed other more or less satisfactory pronouncements. At any rate, if any such difference does exist, it must be confined to Northern Germany, for the South German, Swiss, and Bukowina *aurelia* do not differ except in detail from each other. The Scandinavian *aurelia* again do not appear to be larger, so that it is highly improbable that the species increases in size as it goes northward in Germany. Two large specimens I have seen which I am inclined, on the strength of the under side in particular, to assign to this species, *viz.* a pair submitted to me by Mr. Lowe, which he had obtained from Staudinger as *britomartis*, which they in no way resemble, if judged, as they must be, by the original type. Of this pair the following is a description:—

♂. Up. s. f. w.: border wide, with lunules scarcely visible; outer subterminal thickish, inner of same size; a very broad space before the elbowed line, which is narrow near the costa and slopes very sharply in from the angle to the large marginal blotch; stigma and basal lines indistinct and nearly filled up with black.

Up. s. h. w. as in *aurelia*, but with broader space between inner and extra lines; basal spot distinct.

♀. Up. s.: ground colour in two shades (as in *deione*); f. w. as in *aurelia*, but elbowed line as in ♂, though thicker at costa; h. w. as in ♂.

♂. Un. s. f. w.: inner edging line arched, much more in third space than in others; lunules very small; subterminal lines very close together, both as dark shades; elbowed line visible throughout as an almost connected series of spots. (On the left side the basal lines are joined in the form of an H.)

Un. s. h. w.: with all the characters of *aurelia* exaggerated, especially the lowness of the arches in the outer band; bordering line between outer and terminal bands black and very broad; no trace of the *dictynna* spots in outer band.

♀. Un. s. f. w.: ground colour darker than ordinary *aurelia*, and with elbowed line as in ♂; otherwise as in typical *aurelia*. H. w.: as in *aurelia*, but with the characteristics much exaggerated; outer band light, not differing greatly in colour from terminal band.

The entire absence of the *dictynna* spots at once removes these from the possibility of being *britomartis*, Assmann, and if they represent *britomartis*, Staudinger, the fact of his regarding it as a variety of *aurelia* is sufficiently accounted for. The specimens came from Eastern Europe, and correspond in size with those in the Natural History Museum from Greece and Bulgaria, the latter, however, being somewhat brighter in tint. The under side of Scandinavian specimens is not so characteristic in the hind wing as that of Swiss and German specimens; the ground colour on the upper side is somewhat lighter, and the black markings, as a rule, somewhat heavier. I have seen nothing in this species corresponding with either the *corythalia* or *navarina* forms of *athalia*, but such specimens, unless taken among typical *aurelia*, might probably pass, in the absence of precise data, for the other species. I have one specimen from near Bérisal in which the absence of the upper two-thirds of the "extra" line on the hind wing gives some slight resemblance to *parthenie*, whilst the thickened elbowed line of the fore wing places it in the same category of variation with Freyer's *aphæa*, or with *athalia* var. *mehadiensis*. On the under side the principal directions of variation are in the dark bands of the hind wing, the outer varying much in the extent to which the characteristic lowering of the "arches" is emphasized, and both showing a wide range in depth of colouring. On the whole, the mountain specimens have these bands darker than the lowland examples, and the light bands are generally whiter in those specimens which have the deeper tint in the dark bands. The approach to *dictynna* in the more melanistic males has already been noticed; the more melanistic females, on the other hand, often approach very near to *varia* on the upper side.

The next species, *varia*, is rich both in extreme and in minor aberrations, the former being both melanistic and albinistic, the latter of these being commoner in the male, the former in the female. There is a wide range of these extreme forms in the National Collection, and Aigner-Abafi specially mentions melanic forms of *varia* in the paper previously referred to ('Annals of the Hungarian National Museum,' 1905). They practically extend over much the same range as the aberrations of *athalia*. The minor variations include in the male the extent of dark suffusion of the up. s. h. w., and the greater or less obsolescence of the markings on the upper side, and the fore wing of the under side, and in the female the greater or less extent of melanistic tendency; in both sexes the depth of the ground colour, and of the colouring both of the dark and light bands of the un. s. h. w., is subject to considerable variation. The presence of the greenish tint on the upper side of the female is due to the freshness of the specimen and soon wears off; it is never, in my experience, retained long in the cabinet. The specimens from the Stilfser Joch are described as being very varied in ground colour, extent of basal suffusion, and breadth of black markings, yet some of these variations are, to some extent at any rate, racial; the *varia* of the Heuthal, for instance, both male and female, exhibit much more dark suffusion than those of the Simplon, whereas the females from Campfer in the same neighbourhood are so light as to approach, on the upper side, somewhat closely to *parthenie*. The resemblance between the females of *varia* and *aurelia* on the upper side has already been touched upon, and in very small specimens an approach is occasionally made towards *asteria*; but unless the former are so worn as to have lost the outer line of the border, un. s. h. w., there is always a ready distinctive character—for instance, the specimen in the National Collection labelled "*varia, teste* Hormuzaki" is quite certainly named correctly, though some doubt appears to have been felt in the minds of those who referred the matter to his judgment.

Britomartis is probably the most variable on the upper side of all the species of this group. The males of the first brood bear a very close resemblance to dark specimens of *athalia*; indeed, on one occasion when I was exhibiting a series at Geneva, a well-known lepidopterist was pointing out to a youthful collector, before the meeting began, the peculiarities by which he might know them to be that species, and was hugely surprised, when I suggested his looking at the under side, to find there a very close approximation to *dictynna*. All the first brood males in my possession might well be taken on the upper side for small specimens of var. *mehadiensis*, though of course the under side is totally different; two of the females of this brood might equally well pass as the same variety of *athalia*, but the others are much more obsoletely marked. The second brood is much more varied. I have specimens taken at the same time and place as heavily marked as *aurelia*, and more lightly on the fore wing than *parthenie*; at the same time they have, in series, a facies so remarkably and unmistakably their own that it would seem impossible to confuse them with any other species, if we remember that the *britomartis* of German authors (and of Kirby, who confessedly founds his 'European Butterflies and Moths' on their writings) has no recognizable connection with Assmann's original description, nor with his type specimens. The variation of the under side is principally in two directions—intensity of markings and depth of colour. There is considerable range in the latter respect in the fore wing, and in both light and dark bands of the hind wing, the light varying in both sexes from cream or ivory to silvery-white, and the dark from light orange-brown to very deep cinnamon. There is also considerable variety in the emphasis given to the "*dictynna*-spots," which are sometimes very strikingly developed and sometimes almost rudimentary, as also in the comparative breadth of the un. s. h. w. bands and in the proportion of the two parts of the outer and central bands to each other. The outstanding characteristic of the latter, *viz.* the position of the third and fourth spots of the outer division, thrust as it were out of line, is, however, always present, and often most marked.

(To be continued.)

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By Claude Morley, F.Z.S., F.E.S.

(Concluded from p. 96.)

83. *Coccus alni*, Ratz.*

Ratzeburg states (Ichn. d. Forst ii. 146): I bred male and female *Encyrtus punctipes* from the berry-like *Coccus alni* on alder twigs, and (iii. 189) Hr. Reissig has bred this pretty parasite again. Later (*l. c.* iii. 193) he says Hr. Reissig bred male and female *Encyrtus sericans* from a *Coccus* on alder.

84. *Coccus cambii*, Ratz.*

The same author, after querying its parasitism upon another Chalcid (i. 295), tells us distinctly that *Pteromalus audouinii* was bred (ii. 191) by Hr. Reissig from *Coccus cambii*.

85. *Coccus ulmi*, Linn.

From this species, which Mr. Newstead considers probably synonymous with *Lecanium capreæ*, Linn., Walker has described (Ann. Nat. Hist. xiv. (1844), p. 185) his *Encyrtus machæras*.

86. *Coccus phalaridis*, Linn.

This species is referred to the genus *Lecanium* by most authors, but Mr. Newstead tells me it is in any case unrecognizable. From it Dalla Torre gives (Cat. Hym. v. 247) *Trichomasthus* (*Sceptrophorus*) *cyaneus* and *cyaneifrons*, Dalm., apparently upon Kollar's authority, but *cf.* the synonymous *Encyrtus stigma*, Walk. (Ann. Nat. Hist. xix. (1847), p. 228) in respect to the former, which was also bred from "cottony cocoons"—doubtless Coccids—on a leaf by Curtis (Brit. Ent. fol. 395). Mayr (Verh. z.-b. Ges. 1875, p. 745) raised *Chiloneurus formosus*, Boh., from it; together with (*lib. cit.* p. 695) *Aphycus hederaceus*, West., which I took on ivy at Monk Soham on 8th June, 1908.

87. *Icerya purchasi*, Mask.*

The parasites of this species are stated to be the Pirenid *Ophelosia crawfordi*, Riley ('Insect Life,' 1890, p. 248), *Coccophagus californicus*, Howard (*l. c.* 1889, p. 269), *Encyrtus dubius*, How. (*nec* Fonsc.; *l. c.* 1888, p. 270) from California, and the Proctotrypid *Phanurus* (*Thoron*) *opacus*, How. (*l. c.* p. 268). [Howard's record of his *Isodromus iceryæ* (Report Ent. U. S. Agric. 1886, p. 488) is an error, the species having been raised from the Neuropterous genus *Chrysopa* (*cf.* Ashm. 1900, p. 378.)]

88. *Icerya rosæ*, Riley.*

From a host of this name Ashmead records *Cerchysius iceryæ*, How.—distinct from the last-named Chalcid—from Northern America (Ash. 1900, p. 380). [Dalla Torre (Cat. v. 415) gives *Lestophonus iceryæ* as hemipterous host of *Euryischia lestophoni*, Koebele; Scudder knew no such genus, but *cf.* Riley, Report Ent. U. S. Agric. 1889, p. 92.]

89. *Lichtensia koebelei*, Mask.

Two enemies have been bred from this species in Ceylon. Both *Aphycus lichtensiæ* and *Encyrtus* (*Microterys*) *lichtensiæ*, Howard, are described in Proc. U. S. Nat. Mus. 1896, pp. 636 et 640.

90. *Lichtensia viburni*, Sign.

Two specimens of a *Coccophagus* sp. were bred at Llandaff from this Coccid, and Newstead suggests (Mon. Cocc. Brit. i. 31) that, since *L. viburni* is seldom attacked, the parasite is probably rare. It is improbably exclusive.

91. *Planchonia delicata*, Green.*

From Ceylon we know two parasites of this species (Proc. U. S. Nat. Mus. 1896, pp. 635 et 637), named by Howard *Encarsia planchoniæ* and *Encyrtus* (*Adelencyrtus*) *Planchoniæ* respectively.

92. PROSOPOPHORA.*

An uninstanced species of a genus of this name is said by Howard (Revis. Aphel. 1895, p. 21) to be attacked by *Perissopterus pulchellus*, How.

93. *Aonidia corniger*, Green.*

From an insect of this name, *Encarsia aonidiæ*, Howard, is recorded (Proc. U. S. Nat. Mus. 1896, p. 636).

94. PHENACOCCUS.*

Ashmead has instanced (1900, p. 388) *Aphycus townsendii*, How., from a species of this genus feeding on cotton.

95. *Phenacoccus cavalliæ*, Ckll.*

The same author has devoted a short article to "The Hym. Par. of *P. cavalliæ*, Ckll." (Canadian Entom. 1902, p. 301), which he says include *Cheiloneurus dactylopii*, How., *Signiphora dactylopii*, Ashm., his new *Blepyrus phenacocci*, with its new hyperparasite, *Tetrastichus blepyri*, all bred in New Mexico.

96. *Tachardia albizziæ*, Green.*

Microterys tachardiæ, How., is said to prey upon this species in Ceylon by Ashmead (1900, p. 393).

97. RHIZOCOCCUS.*

And from a member of this genus feeding on a composite plant the same author describes *Signiphora rhizococci* (1900, p. 411), of which one specimen was bred by F. Noack in July, 1897, in Brazil.

ALEURODIDÆ.

98. ALEURODES.

From members of this curious genus are recorded Howard's Aphelinids, *Eretmocerus californicus* (Bull. U. S. Agric. Ent. Techn. 1895, p. 16), *Pterothrix flavimedia* (Rep. Ent. U. S. Agric. 1881, p. 369), *Eucarsia coquilleti*, *E. luteola*, and *E. angelica* (Revis. Aphel. N. America, 1895, pp. 29 et 30). Douglas remarks (E. M. M. 1894, p. 87) upon the immunity from parasitic attacks of his *A. rubicola* throughout its exposed hybernation in Britain.

99. *Aleurodes chelidonii*, Linn.

Dalla Torre gives (Cat. Hym. v. 278) *Eupelmus urozonus*, Dalm., as a parasite of this species upon Rondani's authority;

it appears, however, omnivorous upon Hymenoptera, Diptera, Lepidoptera and Coleoptera. He synonymizes the female (*nec* male) of Walker's *Macroneura maculipes* (Ent. Mag. 1837, p. 354) with this parasite, while Gaulle (Cat. Hym. France, p. 97) gives Walker's species as the same as *Eupelmus degeeri*, Dalm., said by him—possibly in consequence—to also prey upon this hemipteron.†

100. *Aleurodes corni*, Hald.*

The economy of his Proctotrypid *Amitus aleurodinis*, which occurs in Pennsylvania, British Columbia, and Illinois, is set forth by Haldeman (Amer. Journ. Sc. & Arts, ix. (1850), p. 108), and elaborated by Forbes in 1884, Cresson in 1887, and Ashmead (Bull. U. S. Nat. Mus., p. 293) in 1893.

A NEW MEALY-BUG (COCCIDÆ) FROM SOUTH AMERICA.

By T. D. A. Cockerell.

Pseudococcus missionum, n. sp.

About 2 mm. long, of ordinary form, apparently with little mealy secretion; legs stout, lively ferruginous; antennæ 7- or 8-jointed; anal ring ordinary, with six short hairs. Females studied full of eggs, which are 275 μ long and 170 broad.

The species is especially distinguished by its small robust red legs, and small pale antennæ. The following measurements are in microns:—

Hind leg: length of trochanter, 105; of femur, 222; width of femur, 92; length of tibia, 182; of tarsus, 95; bristles on hind tibia, 15; apical bristle of trochanter about 62.

Antennæ: 7-jointed, joints (1) 37–50, (2) 47–55, (3) 40–52, (4) 37–55, (5) 30–45, (6) 37–42, (7) 75–85.

Antennæ: 8-jointed, joints (1) 50–55, (2) 52–55, (3) 50, (4) 22–30, (5) 32–42, (6) 30–35, (7) 32–42, (8) 87–90. The seven and eight joints do not indicate two species; in one case a specimen was 7-jointed on one side and 8 on the other.

The 7-jointed antennæ are close to those of *Ripersia minima*, Tinsl. & King; the 8-jointed are of an ordinary type, almost exactly duplicated in certain specimens of *Pseudococcus kingii*, Ckll., and *P. texensis*, Tinsley.

Hab. — Santa Ana Misiones, Argentine, No. 13 (*Lahille*). The original lot has been divided between the collections of the U.S. Department of Agriculture and the describer.

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† The larvæ of this species is said by Réaumur (ii. Mém. vii., plate 25) to be devoured by a minute coleopterous larva, which Westwood (Introd. ii. 443) suggests is probably that of some species of the Coccinellid genus *Scymnus*.

ON A NEW SPECIES OF PHYTOPHAGOUS *EURYTOMA* (CHALCIDIDÆ) FROM NEW ZEALAND.

By P. Cameron.

While the vast majority of the very extensive family of the Chalcididæ are undoubtedly parasitic on other insects, it is now well known that at least three of the tribes—the Agaonidæ (Fig-insects), the Torymidæ, represented by the Idarninæ (which are connected in some way with the Fig-Chalcids, probably as Inquilines), the Toryminæ, *Syntomaspis* and *Megastigmus*, and the family Eurytomidæ, two of whose tribes, the Isosmini and the Eurytomini—contain plant-feeding species. Not only do those Chalcid groups contain plant-feeders, but a few of them are injurious to the plants on which they feed. So far as I know, all the plant-feeding Chalcids feed in the seeds, except the Isosmini, which form galls on the stems of grasses, and the American genus *Eurytomacharis*, which also makes galls in the stems of the food-plant. At least four of these phytophagous Chalcids must be ranked among injurious insects. The damage done by the American "Joint-worm" to wheat is too well known. *Syntomaspis druparum*, Boh., has proved injurious to apples by devouring the seeds, both in Europe and in the United States. *Megastigmus spermatrophus*, Wachtl (said to be really a native of the Western United States), has proved very destructive to the Douglas-fir in the North of Scotland. I once found the larvæ of *M. aculeatus*, Swederus, in Cheshire, in some quantity in the hips of a garden rose, there being no dipterous or other larvæ present. This species is now found in the United States, and it also has been reared from rose-seed received from China (*cf.* C. R. Crosby, Bull. Cornell Univ. Agric. Exper. Station, Bull. 265, p. 379).* In North America the Eurytomid, *Evoxysoma vitis*, Saunders, badly infests the seeds of the vine. *Brucophagus funebris*, How., in North America is certainly an enemy of the clover and alfalfa by feeding on their seeds.

It would be interesting to know if all the species of *Megastigmus* are vegetable-feeders. *M. pictus*, Foer. (a British species), has been reared from the seeds of the rose, and long ago Mr. Parfitt (Zool. xv. 1857, p. 5543) reared *M. pinus*, Parf., from the seeds of the pine. *M. brevicaudis*, Ratz., has been bred from the seeds of the Rowan (*Sorbus* or *Pyrus aucaparia*). It can hardly be that all species of *Megastigmus* are plant-feeders, unless we are to suppose that they live as Inquilines, like *Synergus*, in the galls made by other insects. Thus Mayr (Verh. z.-b. Wien, xxv. 135) gives a list of nineteen species of Cynipidæ from which *M. dorsalis*, F., has been bred, and of six from which *M. stigmaticans*, F., has been reared.

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* In this paper Mr. Crosby gives a good review of the seed-infesting flies with much new matter.

The whole subject of these plant-feeding Chalcids is well worth the attention of entomologists, alike from an economic and biological point of view. In the following paper I give the description of a new species of phytophagous *Eurytoma* from New Zealand, the life-history of which has been worked out by Mr. F. W. Hilgendorf, of Lincoln College, Christchurch, New Zealand. The insects live in the seeds of the Black Wattle (*Acacia decurrens*), which, although now common and thoroughly naturalized in New Zealand, is in reality a native of New South Wales. Mr. Hilgendorf writes me:—"In the autumn of 1909 I found every seed of a certain tree occupied by a grub, and now in November (*i. e.* the spring of 1909–10) each grub has given rise to the Chalcid referred to. There were no other insects than these among those hatched out."

Eurytoma acaciæ, sp. n.

Black; the knees, tibiæ, and tarsi rufo-testaceous, the head, thorax, and legs thickly covered with white pubescence, the head and thorax strongly umbilicately punctate, the abdomen smooth and shining, the female antennæ stout, smooth, bare, and shining, as long as the head and thorax united, the third joint a little enlarged, longer than the fourth, a little roundly narrowed towards the base and apex the last slightly longer and narrower than the penultimate. Wings hyaline, the nervures and stigma black. Female and male. Length, 3 mm.

The centre of the face is shining, finely, weakly, sparsely punctured, the sides opaque, rugosely, slightly, obliquely striated, the striæ not very clearly defined or separated. Centre of front depressed, smooth, shining, the depression wider than long, the sides stoutly margined, and there is a stout keel down the centre. Apex of clypeus broadly rounded. Parapsidal furrows moderately distinct, shallow. Abdominal petiole short, distinct, not much longer than wide. Metanotum with the punctures running into reticulations, the top broadly rounded. The sides of the scutellum are reticulated, but not so strongly as the apex above is rugosely punctured; the apex above is more coarsely punctured than is the base. Alar nervures stout, the post-marginal vein thinner than the others, and extending clearly beyond the stigmal.

The male has the antennal joints clearly, rather widely separated above, the separations almost forming incisions; the joints of the flagellum are somewhat thickly covered with stiff black hairs, most of which are as long as the joints. The abdominal petiole is longer than it is in the female, being more than twice longer than wide, and a little longer than the hind coxæ.

NOTES AND OBSERVATIONS.

The Tapping of the "Death Watch Beetle."—In reference to the note by Mr. A. H. Swinton (*antea*, p. 64), I must dispute his theory as to the method by which the beetle sounds the "monitory music." Years ago I used to stay at Felixstowe in an old stud-and-plaster house with my family for summer holidays. The timbers there were infested with "Death Watch Beetles," and we frequently heard their tapping. I could make precisely the same "monitory music" by tapping on my watch-case with my finger-nail, and the beetles would answer me. By this means I discovered the whereabouts of several specimens, and they were duly pill-boxed. My captives responded to my tapping with the lid partly open, and I saw they produced the noise by hitting the box with their heads. I would advise Mr. Swinton to experiment as above, and he will find my statement correct. — E. F. Bisshopp; 32, Museum Street, Ipswich, February 2nd, 1910.

[The above note should have appeared in our last number, but we regret that, owing to want of space, it had to be omitted therefrom.—Ed.]

I see there is an article in the March number of the 'Entomologist' by Mr. C. J. Gahan, M.A., and he states he has never witnessed the act of tapping by an *Anobium*, but suggests a method for the purpose. In my former note I not only stated how the insects might be found, but also how to treat them to induce them to produce the tapping. I may add one or two other facts from my practical experience:—1. The taps certainly do not exceed from five to six on an average, though I am not prepared to dispute Mr. Derham's statement that they do go to as many as seven or eight. 2. When tapping, the beetle rises on its legs and rapidly hits with its head downwards right on the "forehead." I can quite believe the Rev. W. Derham of two hundred years ago was "a most accurate and minute observer." I should very much like to see the article where "he has explained in full detail how the *Anobium*, or Greater Death Watch [the insect to which I refer], makes its ticking noise." — E. F. Bisshopp: March 11th, 1910.

Hibernaculum for Vanessa io.—A lady living at a short distance from Cambridge writes on March 3rd:—"We have a great many 'tortoiseshells' and 'peacocks' in the house; I found no fewer than eight 'peacocks' in an old skirt last month."—F. Merrifield; 14, Clifton Terrace, Brighton, March 5th, 1910.

The Clark Collection.—The concluding portion of the collection of British Lepidoptera formed by the late Mr. J. A. Clark was disposed of at Stevens's Auction Rooms on Tuesday and Wednesday, February 22nd and 23rd. It consisted of the latter half of the Geometers, the Micros, and sundry odd lots of duplicates, &c. The first few lots found tardy buyers at small prices, but on the varieties of *Abraxas grossulariata* being reached some little life was imparted to the proceedings; a good specimen of var. *albomarginata* brought £3 5*s*.; a rather nice form broadly bordered with black and the hind wings slightly rayed £2 2*s*.; one with basal half of fore wings black the same figure; another in which the disc of fore wings was orange and blotched with black, £1 1*s.*, and a fine specimen with broad black margins, £2. Some of the better-known forms, however, did not command high prices; thus "*ultra lutea-lacticolor*," with two other varieties, failed to go above 16*s.* the lot; two *varleyata* brought 10*s.* and 12*s.* respectively; *lutea-lacticolor* and *subviolacea* together, 6*s.*; *flavofasciata*, 8*s.*; "a very pale variety," 3*s.*, and so forth. Other interesting varieties among the Geometers were a melanic form of *Ligdia adustata*, which, when offered with the previous lot which had failed to find a buyer, brought £3 3*s.*; four *Camptogramma bilineata*, including a large unicolorous brown form from Sligo, one with chocolate-brown fore wings, one pale banded form, and a greyish brown dwarf, £1 2*s.* the four; a fine black-banded *Eubolia bipunctaria*, £5 5*s.*, and an unusual form of *Tanagra atrata*, £1 1*s.* Six specimens of *Sterrha sacraria*, each with full data, realized from 5*s.* to 10*s.* apiece, and 15*s.* was obtained for var. *labda*; forty *Phibalapteryx polygrammata*, put up in lots of six or five, brought an average of 3*s.* 4¼*d.* per specimen, and twelve *Cidaria reticulata*, sold in lots of two, from 11*s.* to 20*s.* per lot, the average price per specimen being 8*s.* 2*d.*

Little interest appeared to be taken in the Pyrales further than that a lot in which nine specimens of *Madopa salicaris* had been included fetched £1 8*s.*; two *Diasemia ramburialis*, one "Folkestone, 1878," and one from "Burney's Collection," 12*s.*; a lot of forty-three insects, among which were two *Antigastra catalaunalis* and one *Margarodes unionalis*, 16*s.*; and three *M. unionalis*, labelled "F. Bond, 1879," with some sixty other specimens, 12*s.* the lot. But the Crambites attracted a good deal of attention, a lot containing four *Crambus myellus* bringing 17*s.*; two *C. rorellus* (Burney Collection), with fifty-nine other fairly good things, £1 2*s.*; four *C. myellus* and two more of the *C. rorellus*, £1 4*s.*; but four *C. rorellus* from the same source, put up with six *Galleria cerella* and ten *Achrœa grisella*, made only 7*s.* Six *Epischnia bankesiella*, with eight *Anerastia lotella* and three *Epischnia farrella*, realized £1 12*s.* 6*d.* the lot; one *Cateremna terebrella* (C. G. Barrett, Norfolk), with other species, £1 6*s.*; twelve *Ephestia semirufa*, with some fifty other species, £1 8*s.*; a lot of fifty-seven, including *Gymnancyla canella* and sundry *Phycis*, &c., £1 12*s.* 6*d.*; five *Myelois ceratoniœ* in a lot with sundry *Rhodophœa*, &c., £1; one *Trachonitis pryerella* (Nottingham, Briggs's Collection), with *Ephestia kuhniella* and *Myelophila cribrella*, £1 2*s.*; and one *Selagia argyrella* (Mason Collection), with one *Dioryctria splendidella* and nine *Oncocera ahenella*, £1.

Nor were the Tortrices by any means neglected, and although occasionally a lot or two of a hundred or more of the commoner species might be picked up for three or four shillings, anything out of the ordinary soon made good prices; thus the lot containing four *Ditula woodiana* realized £1 10*s.*; two lots, each containing two specimens of *Penthina grevillana*, £1 4*s.* each lot; three *P. fuligana*, with fourteen *Sericoris bifasciana* and others, £1 2*s.*; eight *P. postremana*, in a lot of forty-six insects, £1 12*s.* 6*d.*, and five in one of sixty-eight, 15*s.*; while for the solitary specimen of *Tortrix pronubana*, a male captured at Bognor in October, 1908, the bidding ran up to £1 12*s.* 6*d.* A lot of seventy-nine specimens, including seven *Opadia* *funebrana* and five *Stigmonota leguminana*, sold for £1 2*s.*; and a somewhat similar lot having one more each of these two species, £1 10*s*. Seventy-four *Stigmonota*, including *S. weirana*, *S. trauniana*, &c., brought £1 7*s.*; seventy-eight *Dicrorampha*, including ten *D. alpinana*, eight *D. senectana*, &c., £1 2*s.*; sixty-eight *Eupœcilia*, among which were included fifteen *E. flaviciliana*, £1 5*s.*; and a lot of sundries in which perhaps four *Argyrolepia shreberiana* and eighteen *E. mussehliana* were the attractions, £1 1*s*. A mixed lot of Psychids and Tineids, seven *Fumea casta*, eleven *Dasystoma salicella*, five *Lampronia pubicornis*, and fifty-six others realized £1 6*s.*; and another of seventy-nine, in which *Solenobia inconspiciella*, *Bankesia staintoni*, &c., figured, £1 2*s.*; while sundry other lots, in which some of the rarer Tineids were included, fetched prices of £2, £1 4*s*., £2 17*s*. 6*d*., £2 2*s*., and so forth.

At the commencement of the second day's sale the long series of *Peronea cristana*, on which the late Mr. Clark had bestowed so much attention, were offered; they comprised upwards of three thousand specimens. Among the more interesting items were the type specimens of the varieties that he described and figured in the 'Entomologist's Record,' vol. xiii., which sold as follows:—*Transversana*, *ulotana*, *nigroruficostana* [ined], and *alboruficostana*, 10*s*. the four; *punctana*, *proxanthovittana*, *prostriana*, *subalboflammana*, and *fuscana*, 10*s*. the five; *subchantana*, *nigrosubvittana*, *subfulvovittana*, *nigrocristana*, and *prochantana*, 10*s*. the five; *attaliana*, with another specimen of the same form and one of *subcapucina* (Desvignes), 14*s*. the three; *masoniana*, £1 1*s*.; *charlottana*, £3; *nigropunctana*, *atrana*, *ochreapunctana*, and *intermediana*, £1 the four; and *merlana*, *subunicolorana*, *nigrana*, *rufinigrana*, and *albonigrana*, £1 the five. We believe that all these types are now in the possession of Mr. Sydney Webb. The highest price obtained for any one specimen was £3 5*s*.—for a form between *curtisana* and *charlottana*; while among the other more interesting lots were two examples of a doubtfully new variety near var. *gumpinana*, which realized £1 1*s*. and £2 2*s*. respectively, and another approaching var. *tolana*, for which £2 was obtained; specimens of var. *tolana* sold for 10*s*. each, and one of var. *curtisana* for £2. The series of some six hundred odd of *Peronea hastiana* was offered in five lots, each containing several named forms, the prices per lot realized being 6*s*., 6*s*., 6*s*., £1 12*s*. 6*d*., and £1 2*s*.; and that of *Sarothripus revayana*, consisting of nearly five hundred specimens, brought 8*s*., 8*s*., and £1 10*s*. per lot for the three lots in which it was sold. The remainder of the Tineina which had been left over from the previous day contained many interesting species, and the lots in which they were contained frequently ran up over £1, the highest price given for any one lot being £2 10*s*., and the only lot among the "Plumes" which attracted special attention was that in which a specimen of *Leioptilus brachydactylus* from the Burney Collection was included, which fetched £1. Among the duplicates, &c., six specimens of *Chrysophanus dispar* were offered, of which a fine male brought £3 15*s*.; a fine female, £4 10*s*.; another, £3 15*s*.; a male under side, £2 5*s*.; and the two others, £2 2*s*. and 18*s*. respectively. The sale of the whole collection occupied nearly six full days, and the total amount which it realized exceeded £1300.

On the concluding day two other small properties were disposed of, the only lots of any special interest included in them being a fine male example of *Noctua subrosea*, £3 10*s*.; three lots of four each of *Agriades corydon* var. *syngrapha*, £2 2*s*., £1 10*s*., and £1 10*s*.; two lots, each consisting of four var. *syngrapha* and three intermediates, £2 2*s*. and £1 12*s*. 6*d*. per lot; a specimen of *A. corydon* var. *fowleri*, £1 15*s*., and a fine female under side of *A. bellargus* having the entire disc of the hind wings white, which ran up to £9 9*s*.—R. A.

The Entomological Club.—A meeting was held at "Wellfield," 4, Lingard's Road, Lewisham, on March 15th last. Mr. Robert Adkin in the chair. Other members present were Messrs. Donisthorpe, Hall, Porritt, and Verrall. In addition to three honorary members—Messrs. Jones (A. H.), Sich, and Smith (A. E)—seven other entomologists attended.

The National Collection of British Lepidoptera.—Among recent additions to this collection we note four beautiful examples of *Abraxas grossulariata* ab. *varleyata*, presented by Mr. Porritt of Huddersfield; and a lovely series of *Tortrix pronubana* given by Mr. Robert Adkin, who reared the specimens from Eastbourne larvæ.

Erratum.—P. 104, line 21 from bottom, after "A large number of insects" insert "new to science."

CAPTURES AND FIELD REPORTS.

Euvanessa antiopa in Surrey.—"Mr. Eric Parker writes from Holmthorpe, Weybridge, under date March 5th:—'Entomologists may be interested to hear that to-day, walking in the woods of St. George's-hill, I saw a Camberwell Beauty butterfly. It jumped up at my feet from a bank of pine-needles on which it had been sunning itself, flew about long enough for me to notice that the cream border of its wings was very pale, almost white, and then went away high over the pines.'"—From the 'Times,' March 8th.

Phigalia pedaria ab. monacharia.—I should like to record the abundance of the black form of *P. pedaria* (*pilosaria*) in this district. Last year I found the variety but rarely. This year the black form outnumbers the ordinary type, indeed the latter is scarce. — Wm. Barraclough; Holly Hall, Low Moor, March 15th, 1910.

Ortholitha cervinata and Polia flavicincta in the Epping Forest District.—As my earliest collecting days were spent in this district, I am in a position to answer the question raised by Mr. R. T. Baumann (*antea*, p. 98). In 1868–1870 I collected regularly in a garden at Leyton (where we lived) and in the neighbouring parts of the forest. A complete diary of captures for that period is still in my possession, and the list of species recorded was published in the 'Essex Naturalist' in 1891 (vol. v. p. 153). *O. cervinata* was taken at that time in a lane between our house and the Hackney Marsh, and *P. flavicincta* was taken not uncommonly in the garden at sugar. With respect to this latter species I am inclined to think that it has been getting rarer of late years. It used to be quite common in gardens at sugar, and in 1875–1877 it could be depended upon as a regular autumn species in a garden at Twickenham where I used to collect. Since then I had not seen the species until 1908, when I saw two on sugar at Lyme Regis. Whether this increasing scarcity is real or only apparent must be decided by an appeal to wider experience than mine, as I have done but little autumnal collecting in the South of England for many years.—R. MELDOLA; 6, Brunswick Square, W.C., March 5th, 1910.

ENTOMOLOGY IN IRELAND.—Entomologists are so rare in Central Ireland that anyone seen with a butterfly-net risks being taken, as I have recently been, for a harmless lunatic, but he need fear nothing worse from such a kindly, albeit not very entomological, people. The district of which I write lies between Birr (in King's Co.) on the north and Nenagh (in Tipperary) on the south, a few miles east of Lough Derg; and the collector may there rely on finding many somewhat local or rare insects. *L. sinapis* occurs yearly in considerable numbers; *M. aurinia* and *C. rubi* also yearly, though more plentifully in some years than others. Last June–July, when sugaring was less successful than usual, I found that *Centranthus ruber* and, rather later, its white variety proved wonderfully attractive at dusk, alike to Sphingidæ, Noctuidæ, and Geometridæ. Among the moths taken at the valerian, I may name *C. elpenor*, *C. porcellus* (plentiful), *P. chrysitis*, *P. festucæ*, *P. pulchrina* (plentiful), *P. bractea*, *C. umbratica*, and many common species. In my good-sized garden (containing some three hundred varieties of herbaceous plants) each scattered plant of *Centranthus* had its visitants, and a few Plusias were taken at *Geranium pratense* flore pleno; while profusely blooming honeysuckle and all other flowers failed to yield a single moth.—PERCY BICKNELL; Lincoln Hatch, Burnham, Bucks.

EOIS (ACIDALIA) HERBARIATA, F., IN GLOUCESTERSHIRE. — Mr. W. B. Davis, of Stroud, has generously given me a specimen of this Geometer, which he took on July 11th, 1909, at Messrs. Partridge's Mill, Stroud, flying over a fine species of *Reseda*, said to come from Spain, and used for dyeing cloth yellow. Mr. Meyrick, in his 'Handbook' (1895), at p. 235, states: "*E. herbariata*, F., . . . is said to have occurred in London, but, if authentic, it was doubtless an accidental importation. The species inhabits S. C., and S. Europe." The late Mr. C. G. Barrett, in his 'Lepidoptera of the British Islands' (1902), vol. viii. p. 21, says: "this moth is one of the most rare of our species, and indeed may not be genuinely domiciled here; its sole food seems to be the dried leaves of preserved plants or herbs, and since it is not known to occur regularly anywhere with us, there is room for suspicion that our few native specimens may have been introduced, in the larva state, with imported herbs. This, however, is quite conjectural, and the insect is usually admitted into any British collection, the possessor of which is so fortunate as to secure a specimen. The first record of it in these islands appears to be that by the late Mr. H. T. Stainton, in the 'Entomologist's Annual' for 1856, under the name of *Dosithea circuitaria*, but afterwards corrected by him in the 'Zoologist' for 1858. This was of a specimen taken in Bloomsbury Street, London, and Mr. Stainton added that specimens already existed in the collections of Mr. F. Bond and Mr. A. F. Sheppard. In 1869 the capture of three or four specimens in the shop of a herbalist in Holborn was announced, and in 1873 one was taken from a shop window in Oxford Street. Six years later another was taken in Cannon Street, City; and from that time it does not seem to have been noticed here until 1898, when Mr. Selwyn Image had the good fortune to secure a specimen in Southampton Row, Bloomsbury. Thus all the recorded British specimens seem to have occurred within an area of from one to two square miles in the Metropolis. On the Continent it is said to have quite the same habit, being found in and about houses, and especially herb warehouses." I am indebted to Mr. Edward Meyrick, F.E.S., for his kindness in identifying the specimens, and for the suggestion that the capture should be put on record.—C. GRANVILLE CLUTTERBUCK; Heathville Road, Gloucester, March 18th, 1910.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 2nd*, 1910.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—The President announced that he had nominated as Vice-Presidents for the Session 1910–1911 Professor T. Hudson Beare, B.Sc., F.R.S.E.; Mr. G. T. Bethune-Baker, F.Z.S.; and Mr. H. Rowland-Brown, M.A.—Mr. Edward Morrell Holmes, of Ruthven, Sevenoaks; Mr. E. G. Josephs, of Lincoln College, Oxford; Mr. Ernest Cooper Joy, of 2, St. Kilda's Road, Stoke Newington, N.; Mr. John W. Ward, of Rusinurbe House, Somerset Road, Coventry; and Mr. Frank C. Willcocks, Entomologist to the Khedivial Agricultural Society, of Cairo, Egypt, were elected Fellows of the Society.—Dr. M. Burr gave an account of the Entomological Congress to be held at Brussels in August next, and appealed to all Fellows for their support, as well as to the local Natural History Societies throughout the United Kingdom; and Dr. K. Jordan gave an outline of the sectional programme of papers already arranged.—The Secretary having read a letter from the Entomological Society of Russia, inviting the Society to send a delegate to the forthcoming Jubilee Celebration in St. Petersburg, it was resolved unanimously to send a letter of congratulation to the Society in honour of the occasion.—Mr. John Alderson, who was present as a visitor, exhibited the results of six weeks' collecting in the Rhone Valley, Switzerland, in May and June last, representative in all of one hundred and two species of Rhopalocera.—Mr. E. E. Green sent for exhibition boxes designed for the convenient storage of butterflies in paper envelopes, together with the original model as made by a local tinsmith in Ceylon.—Dr. K. Jordan exhibited two specimens of the earwig, *Arixenia esau*, lately described by him in Nov. Zool., p. 313, Pl. xvi–xviii (1909). The insect was discovered in the breast-pouch of a specimen of the naked bat obtained in Sarawak. Under the microscope were shown the mandible and maxilla of *Arixenia*, together with the mandible of *Hemimerus*.—Dr. Malcom Burr, D.Sc., F.L.S. F.Z.S., communicated a paper entitled "A Revision of the *Labiduridæ*, a Family of the *Dermaptera*." The discussion of the affinities of *Agriades thetis* (*bellargus*) and *A. corydon*, adjourned from the December meeting, was resumed by Mr. J. W. Tutt, who exhibited long series of the two species, demonstrating in particular the several forms of *A. corydon* as occurring in the palæarctic region. He pointed out in detail the nearness of the two Agriadid species in the structure of their eggs, larvæ, pupæ, imagines, especially noting in the latter case the similarity in the male genitalia. Not only was their environment similar, and their morphological structure almost identical, but their actual range was practically the same. Exhibitions were also made by Mr. G. T. Bethune-Baker of varieties of *A. corydon* from Spain, Greece, Syria, Asia Minor, and Persia, and of *A. thetis* (*bellargus*) from Spain, Algeria, and Greece; by the Rev. George Wheeler, of examples from Italy and Central Europe; and by Miss M. E. Fountaine, of *A. corydon* var. *olympica*, taken by herself at Amasia, Asia Minor, and of *thetis* var. *syriaca* from the Lebanon. At the end of Mr. Tutt's remarks the discussion was continued by Mr. A. L. Rayward, Mr. Hamilton H. Druce, the Rev. G. Wheeler, Dr. T. A. Chapman, Mr. W. G. Sheldon, Miss Fountaine, and other Fellows, the President paying a special tribute to Mr. Tutt's lucid explanation and diagnosis of the various forms of the two closely allied butterflies. — H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 13th*, 1910.—A. Sich, Esq., F.E.S., President, in the chair.—Mr. South, on behalf of Mr. Hallam Moore, of Barnet, exhibited specimens of Coleoptera, &c., mounted on transparent gelatine card, allowing of ready examination.—Mr. Adkin, a series of *Selenia bilunaria*, bred from Eastbourne ova, and read notes on the brood.—Mr. Lucas, photographs of *Hybernia defoliaria*, taken on January 4th and 8th.—Mr. Turner, on behalf of Rev. C. R. N. Burrows, series of the genus *Hydrœcia*: *H. nictitans*, *H. palustris*, *H. lucens*, and *H. crinanensis*, together with microscopical preparations of the genitalia, and photographs of the same.—Mr. Tonge, a bred series of *Cidaria miata*, from Chichester; a bred pair of *Catocala fraxini*, from ova laid by a female taken at Horsham; and two species of Hymenoptera bred from a bamboo-cane standing in a garden at Redhill.—Mr. Newman, living specimens of *Pyrameis atalanta*, which he was endeavouring to hybernate.—Mr. A. H. Hemming, an under side aberration of *Polyommatus icarus*, taken at Redhill, in which the submedian spots were closely clustered around the discoidals; on the hind wings some spots were obsolete.—Mr. Enock gave a lantern demonstration of the life-histories of *Gonepteryx rhamni*, *Dicranura vinula*, and *Urapteryx sambucaria*, and many illustrations of the marvellous and delicate hymenopterous egg-parasites, Mymaridæ.

Annual General Meeting, January 27th, 1910.—Mr. A. Sich, F.E.S., President, in the chair.—A satisfactory Balance Sheet was read and adopted, as was also the Report of the Council. The President declared the following gentlemen duly elected as Officers and Council for the Session 1910–1911:—President, W. J. Kaye, F.E.S.; Vice-Presidents, A. Sich, F.E.S., and A. E. Tonge, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dods; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.Z.S., F.E.S. (Corresponding), and Hy. J. Turner, F.E.S. (Reporting); Council: R. Adkin, F.E.S., S. R. Ashby, F.E.S., E. C. Joy, F.E.S., H. Main, F.E.S., A. M. Montgomery, F.E.S., R. A. R. Priske, F.E.S., and B. H. Smith. A letter was read from Mr. Kaye, thanking the Society for the honour done him, and explaining his absence for the next few months as due to his having undertaken an expedition to Southern Brazil in search of Lepidoptera and evidences for or against mimetic resemblance. The President then read his address, and hearty votes of thanks were passed to the Officers and Council.

Ordinary Meeting: Mr. A. Sich, F.E.S., Vice-President, in the chair.—Mr. R. D. Morford, of Upper Kennington Lane, was elected a member.—Mr. Tonge and Mr. Colthrup exhibited long series of *Hybernia aurantiaria*, *H. defoliaria*, and *Himera pennaria*, taken in New Forest, November 17th to 19th, 1909, where they were abundant, in spite of the weather being clear and frosty. Mr. Colthrup exhibited a *Gonepteryx rhamni*, found at the same time, hibernating among holly.—Mr. Turner, a short series of the beautiful *Limonias* (*Melitæa*) *taylori*, and specimens of *Basilarchia lorquinii* from Victoria, Vancouver Island. A short discussion took place on the hibernating habits of *G. rhamni* and *Orrhodia rubiginea*.

February 10*th*, 1910.—Mr. A. Sich, F.E.S., Vice-President, in the chair.—The deaths were announced of two members, Mr. Kirkaldy and Mr. McArthur.—Mr. H. J. Turner exhibited a series of the brilliant Lycænid *Danis taygetes* from Brisbane, obtained by Dr. Lucas, an old member of the Society.—Mr. J. P. Barrett, a box of conspicuous insects of various orders from near Messina, Sicily, including an immature mantis and a *Pieris brassicæ* it had captured on a flower-head.—Mr. Coote and Mr. Barnett exhibited *Hybernia defoliaria*, which species was said to have been very abundant at West Wickham from November to mid-January.—Mr. Moore, a box of various species of Diptera, mainly from Africa, and which were instrumental in spreading disease.—Mr. West, Ashstead, a specimen of the "fish" insect, *Lepisma saccharina*, which had existed two months without food.—A number of members brought microscopes and slides, and the rest of the evening was spent as a microscopical one.

February 24*th*.—Mr. A. Sich, F.E.S., Vice-President, in the chair.—Mr. G. S. Robertson, of Dulwich, was elected a member.—Dr. Chapman exhibited a bred living specimen of *Callophrys avis* from South France, and pointed out its divergence from the closely related *C. rubi*.—Mr. Barnett, a long series of *Hybernia aurantiaria* from West Wickham Wood, where it was abundant in November of last year.—Capt. Cardew, gynandromorphs of *Amorpha populi*, *Agrotis puta*, and *Dryas paphia*, the last-named captured in the New Forest.—Mr. Russell, a strikingly aberrant form of *Polyommatus icarus*, from Reigate; the under side was striated on the right wings only.—Mr. Sperring, *Agrotis agathina*, from Chiselhurst, and a smoky example of *Arctia villica*.—Mr. Adkin, a bred series of *Peronea permutana*, from Sussex, and read notes on its occurrence and characteristics.—Mr. Alderson, a large collection of butterflies taken by him in a six weeks' holiday in and near the Rhone Valley during May and June of last year. Over one hundred species were represented, most of them being in very fine condition.—Mr. R. Adkin read a paper entitled "The Lepidoptera of a London Garden." —Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*January 4th*, 1910.—Pocket-box Exhibition. Exhibits: *Hydrœcia nictitans*, L., *paludis*, Tutt, *lucens*, Frr., and *crinanensis*, Burrows, with microscopic mounts, and photographs of the genitalia of both sexes of each species to show the specific distinction, Rev. C. R. N. Burrows.—*Agriades corydon* var. female *syngrapha*, and *A. thetis* (*bellargus*) var. female *cœlestis*, Obth., both from West France, Dr. T. A. Chapman.—*Nonagria neurica*, Hb. (*edelsteni*, Tutt), from Sussex, with the new aberrations *rufescens*, Edelsten, var. *fusca*, Edelsten; also the ova and pupa *in sitû*, and photographs of the early stages by Mr. Main, to illustrate the life-history of the species, Mr. H. M. Edelsten.—*Agriades corydon*, males and females, from the South Downs, August, 1909; the males showing shades from steel grey to bright blue, and some females of ab. *semi-syngrapha*, Mr. A. F. Hemming.—Butterflies taken mainly, in 1909, in parts of Surrey and Sussex, showing some variation in series, Dr. G. G. C. Hodgson.—*Catocala fraxini*, bred from eggs laid by the female specimen taken at Horsham, Sept. 9th, 1908, Mr. G. H. Leach.—*Arctia villica*, *Spilosoma fuliginosa*, *S. mendica*, *S. lubricipeda*, with var. *radiata* and *S. menthastri*, with its buff aberration, Mr. A. W. Mera.—*Venusia cambrica*, with its two melanic forms, ab. *bradyi*, bred, from Sheffield district, with both wings melanic, and ab. *lofthousi*, from the Middlesbrough district, with only the fore wings melanic, yet still streaked longitudinally with white, Mr. L. B. Prout.—*Abraxas grossulariata*, aberrations bred from larvæ taken wild in North London upon *Euonymus*. One other specimen, suffused and spotted with black, taken by Mr. Southey at Barnsbury in 1884, Mr. J. Riches.—Lepidoptera from Rannoch, Bude (including a remarkable aberration of *Aplecta prasina* (*herbida*) with the centre of the fore wings very pale, and *Boarmia repandata* var. *conversaria*), Reigate and Potters Bar, Mr. L. A. E. Sabine.—*Smerinthus*, Hyb., *hybridus*, three specimens bred October, 1909; *Amorpha populi*, a gynandromorph, left side male, right side female, bred June 10th, 1909; and a series of *Thecla quercus*, bred from New Forest larvæ, July, 1909, Mr. V. E. Shaw.—*Depressaria putridella*, first taken in Britain by Mr. E. D. Green, who found the larvæ at Whitstable in 1906; an interesting addition to the British fauna on account of its southern distribution and large amount of variation; also *D. umbellana* and *D. yeatiana*, for comparison, Mr. A. Sich.—*Tapinostola fulva*, series taken in Richmond Park, September, 1909, Mr. P. W. Tautz.—*Rumicia phlœas*, ab. *alba*, taken at Brasted, Kent, August 28th, 1909; and several specimens of *Cupido minimus*, unusually small, little more than half the usual size, taken at Winchester, June, 1909, Mr. H. J. Turner.—*Agriades corydon* ab. *fowleri* from Swanage, and ab. *suffusa* from Shanklin, Mr. C. H. Williams.—*Melitæa cinxia*, groups showing gradation of ground colour and intensity of markings; some of the specimens were distinct from the groups, and formed striking varieties; the insects exhibited were picked from specimens bred from wild Isle of Wight larvæ collected over a series of years.—Council for 1910:—President: A. W. Mera; Vice-Presidents: Dr. T. A. Chapman, Rev. C. R. N. Burrows, Messrs. Frederick J. Hanbury, and L. B. Prout; Trustees: Dr. J. S. Sequeera and Mr. L. B. Prout; Treasurer: Mr. P. H. Tautz; Librarians: Messrs. V. E. Shaw and H. M. Edelsten; Curators: Dr. G. G. C. Hodgson and Mr. A. J. Willsdon; Hon. Secretaries: Messrs. S. J. Bell (Reporting), and T. H. L. Grosvenor (Corresponding), and Messrs. A. W. Bacot, F. B. Cross, G. H. Heath, J. Riches, and A. Sich.—C. R. N. Burrows.

The Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Colquit Street, Liverpool, Monday, January 17th, 1910, Dr. P. F. Tinne, Vice-President, in the chair.—A lecture was delivered by Mr. C. F. Walker, M.A., of the Liverpool University, on Mendel's 'Theory of Inheritance.' The lecturer by means of some excellent lantern slides gave a very lucid and interesting account of Mendel's discovery, and also adverted to the recent work which has been done by numerous investigators. Mr. Walker mentioned the experiments of Messrs. Prout and Bacot with *Acidalia virgularia*, instancing it as a case of "Blended Inheritance," to which the Mendelian principle did not appear to apply. At the close a vote of thanks was proposed by Mr. Wm. Mansbridge, who made a few remarks in opening the discussion which ensued. The motion, seconded by Mr. F. N. Pierce, was carried by acclamation, and Mr. Walker suitably replied.—Mr. F. N. Pierce exhibited a female specimen of *Hydrœcia crinanensis* captured at Bolton, Lancs, in 1897, by Mr. J. E. R. Allen. This is the first record for England. Mr. Allen also recorded the moth from Enniskillen, Ireland.—Mr. Wm. Mansbridge showed his series of *Aplecta nebulosa*.—The meeting was adjourned until February 21st.

February 21*st*, 1910.—Meeting held at the Royal Institution, Colquit Street, Liverpool, Dr. P. F. Tinne, Vice-President, in the chair.—The following gentlemen were elected members of the Society:—Mr. H. S. Leigh, of Worsley; Mr. T. A. Clarke, of Hooton.—Mr. Wm. Mansbridge gave an address on "Variation in Lancashire Lepidoptera," specially instancing such species as *Boarmia repandata*, *Aplecta nebulosa*, *Macaria liturata*, *Odontopera bidentata*, and *Melanthia bicolorata*. The various local forms of these species were described, and their distribution within the Society's area fully noted. A discussion ensued, in which the Chairman, Mr. F. N. Pierce, Mr. R. Tait, Jun., and others took part.—Mr. Wm. Mansbridge exhibited his series of *B. repandata* to illustrate his remarks; also the well-known Cheshire forms of *A. nebulosa*. Dr. Tinne also showed *repandata*, including vars. *nigra* and *conversaria*, the latter from the New Forest.—Mr. A. W. Boyd brought *repandata* var. *nigra*, *Hybernia defoliaria* and *H. aurantiaria*, from Delamere Forest. Mr. Tait's exhibit included a fine and varied series of *Himera pennaria*, from Monks Wood. The meeting was adjourned to March 21st.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

Hyponomeuta irrorellus, Hüb., in Lancashire: a Correction.—Referring to the record of this insect at Silverdale, in the report of the November meeting of the Lancashire and Cheshire Entomological Society, my attention having been directed to the fact that the species was only taken in a very restricted area in Surrey, and has not been known to occur for many years, I took an opportunity of comparing the specimens with Mr. Capper's collection, and found them to be only the common *H. evonymella*, Sc. (*cognatella*), Hüb.—Wm. Mansbridge, *Hon. Recording Sec.*

RECENT LITERATURE.

A Monographic Revision of the Twisted Winged Insects, comprising the Order Strepsiptera, Kirby. By W. Dwight Pierce. Bulletin 66, Smithsonian Institution. Washington, 1909.

In this we have a most important monograph of 232 pages, illustrated by fifteen plates, a map, and text-figures, treating in a most thorough manner with an obscure group of insects. The author tells us that, "after being tossed about from one point to another amongst the insect orders, it seems to be pretty generally acknowledged that they [the Strepsiptera] must be accorded ordinate rank." He concludes therefore that the Strepsiptera form "a separate order, on a distinct line of descent from that of the Coleoptera, and nearer the Hymenoptera and Diptera, and as highly specialised as the highest insects in any of the orders." They are of economic interest as being parasites on Orthoptera (Blattodea and Gryllodea), Homoptera, Heteroptera, and Hymenoptera. The young at first look like the primitive insect *Campodea*, "being very lively little hexapods, with two bristles at the caudal end, and with padded clawless feet." When settled on a host they lose legs and eyes and become entirely grub-like. The monograph treats fully of the life-cycle, structure and anatomy, experiments and observations in connection with the insects, and inter-relation of host and parasite. There is a description of all the species, with many tables, list of hosts, glossary, and full bibliography. The author finds that there are one fossil and one hundred and eight recent species, four of them being queried. The European species are twenty-four.

W. J. L.

Catalogus Hemipterorum (*Heteropterorum*), auctore G. W. Kirkaldy: volumen i. Cimicidæ: Berolini, sumptibus Felicis L. Dames: mdcccix. pp. xl. et 392.

Always original and sometimes apparently bizarre in his nomenclatorial notions, Mr. Kirkaldy has left us the first stone—a monolith of no mean proportions—of his proposed general Catalogue of the world's Heteroptera. It is in reality much more than a list of names, their synonyms, and references, for it embraces both distribution and the (we believe) unique feature of references to the entire biology. In the preface an early opportunity is taken of discussing types, genotypes, and classification; tables of superfamilies (to which the curious suffix *-oideæ* is applied), bibliography, dates, and other pertinent matters are duly noticed. Mr. Kirkaldy's Cimicidæ is what has hitherto been known under the name Pentatomidæ, and care must now be exercised not to confuse our old nocturnal enemy with his *Cimex* (*Picromerus*, olim) *bidens*, concerning which references are given to the speratozoa, ovaries, teratology, and such varied foods as birch, ling, sallow, larvæ of sawflies, of Chrysomelid beetles, of lacewing flies, and even its erstwhile namesake. *Clinocoris* (*Cimex*, olim) *lectularius*, L. That Mr. Kirkaldy's peculiar ideas respecting priority will stand the test of time, doubt must be expressed; but that he has produced a work of the greatest and most lasting value to heteropterists is undeniable. Dufour's remark, which is claimed to be still true when the preface was penned, that "cet ordre d'insectes se trouve un des plus négligés, des plus arrières," is certainly falsified by the very production of this Catalogue. Douglas, Scott, and Saunders have laboured since this quotation was written, but Kirkaldy attempted a greater work than them all. Ställ failed to complete more than five volumes; Lethierry and Severin produced but three of their 'Catalogue Général des Hémiptères' (1893–4–6). That before us is the fullest, and, unfortunately, it stands alone. *Ars longa, vita brevis!*

C. M.

OBITUARY.

Albert Piffard.—The deceased's father collected Lepidoptera, and was a good all-round entomologist; his favourite haunts were the woods around Paris, before the construction of the Versailles Railway, long since felled. His collections passed to Mr. Bernard Piffard, of Brockenhurst, the deceased's elder brother, who subsequently gave them away in the New Forest. At the time of the Franco-Prussian War, Albert Piffard* was living in France, but he then took up his residence at Felden, near Boxmoor, in Herts, where he lived to the time of his death on December 5th last, at the age of seventy-five. The family are Huguenot, descending from a great-grandfather, a citizen of Geneva, who took out patents of English naturalization in order to acquire land here. There is no other family of the name in Britain. Albert's mother was a Miss Sabine, born in December, 1834, and collected beetles in 1845; she used to find *Crioceris merdigera*, when a girl, on lilies in the garden of the Manor House, Islington, and noticed both its smell and stridulation. Our subject was articled to Robert Wilson, Q.C., at the age of eighteen, and then knew Epping Forest well (quite wild, with rabbit-warrens and impassable bogs); he was in the habit of visiting a naturalist-gamekeeper, who lived in Queen Elizabeth's Lodge. Subsequently Mr. Piffard travelled in Spain, Asia Minor, and America. He lived in Algeria for some years, learnt Arabic when about twenty, and assimilated something of the native religion. He was a great sportsman and hunter, walked forty-two miles at a stretch, and several times narrowly escaped death in Northern Africa. He never earned money, for which there was no need, as his charming residence amply testified. His first love was the Coleoptera, but he amassed Diptera for the National Collection during a decade from 1892. He had been extremely melancholic, through severe family affliction, for some years, and had long retained a house nurse; but his final breakdown was surprisingly sudden. He sustained a fall and injured his leg, though much recovered by September; during the autumn, however, he gradually became more feeble and ill, till the end was reached in December. His collections and books are passed to his nephew, Mr. C. T. Gimingham; the former are considerable, though the nation is the richer for his Diptera, and the writer for his Parasitic Hymenoptera. Reticent in his writings and at all times retiring, his personality was lavish of all good things, both entomological and hospitable, to those he liked, as many entomologists both of this and the last generation can testify. Piffard, Chitty, Saunders, Bignell—what havoc is wrought in our vanguard! *Sic transit gloria mundi.*

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* It is of interest to mention, since many appear under misapprehension on the subject (Mr. Piffard told me in 1900, while I was staying at Felden), that Herbert E. Cox, the author of the well-known coleopterous 'Handbook,' was an independent gentleman, who married early in life; a very handsome man, whose children were off his hands about 1894, and he then permanently went abroad. At that time he was studying foreign Coleoptera, and bought somewhat largely at Stevens's. He wrote his standard work in about two years, while residing at Harrow, and was a strong Unitarian—hence the interesting dedication. Should this meet his eye, we trust Mr. Cox will forgive the liberty taken; it is our informant's, and not his, obituary we write.

C. M.

George Carter Bignell.—Mr. Bignell was born at Exeter on March 1st, 1826, and educated at St. John's College there; he joined the Royal Marines at Stonehouse in 1842. During the Civil War of 1847 he was on board the 'Superb,' and took part in the capture of the rebel army. Later he became employed in the Office of Works, and filled a post in Millbay Barracks. In 1862 he was discharged with the rank of Barrack-Master-Sergeant, with a Long Service Medal. For the Stonehouse District he was almost immediately appointed Registrar of Births and Deaths, Poor Law Officer, and Vaccination Officer. In a more scientific way he contributed to the 'Entomologist' from 1864, the 'Young Naturalist,' and was on the editorial staff of the 'British Naturalist.' The consummation of these labours came in 1893, when he was elected President of the Plymouth Institution and Devon and Cornwall Natural History Society. He was a first-rate field entomologist, attacking all Orders of insects, and received a bronze medal from the Royal Cornwall Polytechnic Society for a paper on Land and Freshwater Shells. Recently he suffered from an attack of influenza, partially recovered, but finally succumbed on the supervention of bronchitis at The Ferns, Home Park Road, Saltash, barely breathing into his eighty-fourth birthday. His entomological collection (in whole or part) was presented by him to the Municipal Museum at Plymouth last November.

C. M.

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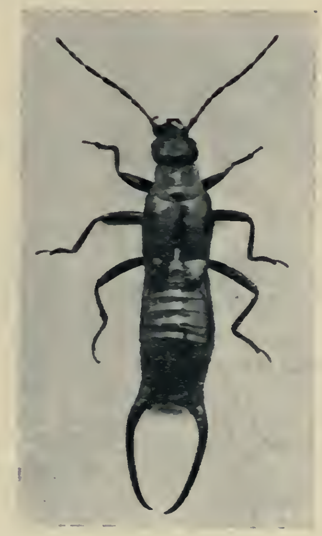
ODONTOPSALIS LEWISI, Burr (Orthoptera).

By W. J. Lucas, B.A., F.E.S.

In January, 1904, a specimen of this earwig was taken amongst "sweepings" in St. John's Market, Liverpool. Though of course the capture is interesting, it does not constitute the insect a British one, and we must not add the name to our list. Recently I have had the opportunity of photographing the specimen, which is in good condition, and am therefore able to give a figure of it. Both genus and species were described by Burr in Trans. Ent. Soc. Lond. 1904, pp. 315 and 317, from specimens taken in Japan. His description is as follows:—"Nigra, vel fusco-castanea, alis flavescentibus, nigromaculatis. *O. harmandi* vicina; ab eo differt statura majore, minus depresso, colore fusciori, abdomine minus dilatato ac deplanato, segmento ultimo dorsali ♂ tuberculis minimis instructo, forcipe graciliori,



O. lewisi (× 3·25).

longiori, dentibus minus validis, pedibus longioribus, gracilioribus. Long. corporis ♂ 14 mm. Long. forcipis 4 mm." In size and general appearance it is somewhat like our common *Forficula auricularia*, but the callipers are very different, as the figure shews.

THYAMIS BRUNNEA AND *LURIDA*.

By David Sharp, M.A., F.R.S., &c.

These two insects have always been a great trouble to coleopterists, as is made clear enough by the remarks of Mr. Rye, quoted by Canon Fowler (Brit. Col. iv. p. 342). Since then Weise's important work (Ins. Deutschlands, Col. vi.) has become known to us, and, as his views are not only of great importance but of much interest, I revert to the subject.

Weise considers the *luridus* of our Catalogues to be a winged form of our *brunneus*. And he has also changed the names, applying *brunneus* to our *castaneus*. According to him the forms stand:—

1. *brunneus*.
    castaneus, Brit. Cat.
2. *luridus*.
    brunneus, Brit. Cat.
    var. (*alatus*) = *luridus* var. *cognatus* Weise, = *luridus*, Brit. Cat.

The matter is even more complicated, as he considers that the wingless form is the original "*luridus*" of Scop. But I think we ought not to follow Weise in the changes of names he proposes. These result from the fact that he interprets the old description of *brunneus* Duftsch., differently from his predecessors, with the result that the literature for three generations would become a chaos. It is possible Weise may be right, and it is possible Weise may be wrong, and I think in such a case the opinion of his predecessors should be maintained.

As regards the question whether *luridus* and *brunneus* are distinct species, or winged and apterous forms, respectively, of one species, decision is much more difficult.

Weise's work is a comprehensive and masterly one, and his opinion is entitled to the greatest respect. He says that our *luridus* is a winged form that does not extend northwards beyond 55°, though the wingless form goes farther north. In this he may be correct; at any rate, our *brunneus* occurs in profusion in the South of Scotland, as well as all over England, but our *luridus* has not been found even in Southern Scotland, though it is not rare in England, and has been recorded as far north as Northumberland, *i. e.* just about the 55th parallel.

But besides the distribution being different, the variation of the two insects is dissimilar. For our *brunneus* is a most puzzling creature on account of its variation, while our *luridus* is, for a *Thyamis*, remarkably constant.

Hence, if the two be really one species, as Weise maintains, we have the remarkable condition that a variable wingless species produces winged individuals in the case of only one of its varieties, as well as over only a portion of the area of its distribution.

This is certainly far from impossible; but we know nothing of the life-histories, and until we do so I do not think we can accept Weise's opinion as certainly established. It is true that the ædeagus of the male is extremely similar in the two forms, but the structure of this organ is very simple and very much alike in the different species of *Thyamis*, so that I feel by no means sure that this character is decisive.

I consider the question, therefore, to be one still requiring elucidation.

Brockenhurst, April 10th, 1910.

ON NEW SPECIES OF PARASITIC *CYNIPIDÆ* CAPTURED BY MR. JOHN HEWITT, B.A., AT KUCHING, BORNEO.

By P. Cameron.

Paramblynotus rufiventris, sp. n.

Black, the abdomen rufous, the wings hyaline, the radial and first cubital cellules smoky, the nervures black. Pro- and mesonotum closely, somewhat strongly reticulated, the scutellum much more widely and irregularly reticulated; propleuræ reticulated like the pronotum, the mesopleuræ almost smooth, densely covered with depressed silvery pubescence; the metapleuræ irregularly areolated. Metanotum areolated, the lateral areæ larger and wider than the central; its sides and lower part covered with silvery pubescence. Face rugosely punctured; there is a stout keel between the antennæ; it is, as is also the oral region, densely covered with silvery pubescence. Ocellar region raised, margined, rounded in front. Collar margined behind by a smooth keel. Apical abdominal segments fringed with white pubescence. ♀. Length 4 mm.

The legs are stout, and are densely covered with silvery pile. The puncturation on the thorax is stronger than it is on the other Bornean species, from which it may be further known by the red abdomen.

For a synopsis of the previously described Bornean species of *Paramblynotus* see the Deutsch Ent. Zeitsch. 1909, p. 18.

The ocellar region in *Paramblynotus* is raised, clearly separated, triangular; the ocelli are in a curve. The male has the antennæ fourteen-jointed; they are shorter than the body, of almost equal thickness, the third joint is a little shorter than the fourth, and is neither thickened nor curved. The abdomen is somewhat compressed and has the petiole longer than it is in the female.

Paramblynotus carinifrons, sp. n.

Black; the abdomen, except the first segment, red, densely covered with white stiff pubescence, densely so on the sides of the head, on the pleuræ, tibiæ, and tarsi; wings, to the transverse basal nervure, hyaline, the rest fuscous violaceous, the nervures black. ♀. Length 8 mm.

Face rugosely punctured above, the rest covered with stout curved striæ. Front and vertex smooth, the sides raised, margined on the inner side, the raised part becoming gradually widened below and covered densely with white pubescence. Pronotum coarsely, irregularly reticulated. Mesonotum less coarsely, irregularly striated at the base, the rest irregularly reticulated. Scutellum more strongly and regularly striated than the mesonotum. Metanotum very short, perpendicular, reticulated. Propleuræ coarsely reticulated, the meso- and metapleuræ smooth, sparsely haired.

Paramblynotus annulicornis, sp. n.

Ferruginous, the antennæ, except the scape, which is ferruginous, and the eighth, ninth, and tenth joints of the flagellum, which are white, the four anterior coxæ, the greater part of the femora, apex of hind coxæ, and the hind femora, tibiæ and tarsi, the sternum and the abdomen, black; wings hyaline, the nervures black, a black cloud covering the radial cellule and extending backwards to shortly beyond the middle of the wing, becoming gradually narrowed and forming a longish triangle.

Face closely reticulated, the front and vertex smooth, the sides raised, irregularly reticulated and margined on the inner side. Temples stoutly irregularly, longitudinally striated. Pro- and mesonotum with scutellum and propleuræ coarsely reticulated. Mesopleuræ smooth, the metapleuræ coarsely reticulated. Metanotum with a depressed area, narrowed above in the centre, the sides widely reticulated. Abdominal petiole more than twice longer than wide and bearing stout longitudinal keels. ♂. Length 5 mm.

Abdomen smooth and shining, somewhat compressed, as long as the thorax. Cubitus narrow, not very distinct, roundly curved. Frontal keel stout, and it is continued, but more narrowly, down the face. Cheeks stoutly keeled.

Xystus borneanus, sp. n.

Black, smooth, and shining, the third joint of antennæ testaceous, the legs pallid yellow, tinged with fuscous; wings hyaline, iridescent, the nervures fuscous, the outer edges distinctly ciliated; radial cellule closed along the fore margin, where it is clearly longer than it is from the margin to the second cubital cellule; the apical abscissa of radius roundly curved, longer than the basal and thicker than it; second cubital cellule not defined, the cubitus obsolete. Antennæ almost twice the length of the body; the third joint straight, twice the length of the following. Head large, clearly wider than the thorax. ♂. Length 1 mm.

The coxæ are darker coloured than the rest of the hind legs, almost black. The antennæ are lighter coloured, *i.e.* almost fuscous underneath.

The species of *Xystus*, so far as we know, are parasitic on *Aphidæ*. This is the first species of *Xystini* I have seen from the Oriental Zoological Region.

Xystus tinctipleuris, sp. n.

Black, bare, shining, the pronotum and pleuræ rufous, the legs rufo-testaceous, the hind tarsi darker coloured; wings hyaline, the nervures black, the radial cellule more than twice longer than it is wide at the commencement of the cubitus; basal abscissa of radius straight, the apical roundly curved, fully one-third longer than the basal; cubitus distinct to the apex of the wing; the apex of the wings shortly ciliated. The antennæ twice the length of the body, bare, the third joint not curved or dilated, one-fourth longer than the following joint. ♂. Length 1 mm.

A larger, stouter species than *X. malayana*, with larger radial cellule, owing to the apical abscission of radius being longer compared with the basal, the nervures, too, being black; and the legs are of a deeper red colour.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 110.)

The range of variation in *dictynna* is considerably greater than its very special facies would lead one to expect, but the development does not take place in any unusual direction. The depth of colouring, extent of suffusion both of the dark bands and of the base, variegation of the bands of the ground colour on the upper side, depth and extent of the markings on the f. w., and the colour and proportion of the bands of the h. w. form, as in other species, the elements of variation. With regard to the proportion of the black and the ground colour, every imaginable distribution is to be found, from the light f. w. of *vernetensis* to the black h. w. of *seminigra*; nor does it at all follow that the fore and hind wings present anything approaching parallel variation; neither can I find any rule, either of altitude or latitude, which seems to govern this distribution of coloration, though the mountain forms are on the whole both smaller and darker than those of the plains; the exceptions, however, are so many, that to formulate a law on the matter would be impossible, the var. *vernetensis* alone being apparently confined to that part of the Pyrenees to which it owes its name. The depth of the ground colour varies from a deep red-brown to a pale yellow ochre shade, the latter being confined to light specimens of the female, and being more usual on the hind than on the fore wing. The variegation of the ground colour into lighter and darker bands is not entirely confined to the female, though its appearance in the male is rare. In the former it is sometimes carried to a surprising extent, so much so that Bergstrasser, in his 'Nomenklatur,' iii. pl. lxxviii. fig. 6, depicts it under the name of *maturna*, and then is not unnaturally surprised at its absence of red. The finest specimens I have met with come from Bouveret, at the upper end of the Lake of Geneva, the most beautifully varied on the upper side from Weesen on the Walensee, and from Austria. On the under side there is great variety in the colour and proportion of the bands of the hind wing. There is nearly always a considerable difference between the colouring of the edging and the lunular portion of the terminal band, and usually, but not always, between the two portions of the central band as well. Sometimes the lunules of the terminal band, sometimes the outer division of the central band, sometimes the light spot and the basal band, or two, or all three of these, are dead-white, or almost as silver as the spots of the Argynnids, sometimes only the spots near the inner margin; in other cases these bands are of various shades of pale or rich buff; the dark bands vary equally in colour, they may be of a deep, rich, cinnamon-brown, of a lighter orange-brown, of a dirty yellow-brown, or even of a rich orange containing only a brown tinge. The characteristic spots of the outer band are generally very conspicuous, but occasionally they are somewhat obscured by the darkness of the band, as in some specimens from Bouveret and from Hinterzarten in the Black Forest; or they may be ill-marked, as in some of the very orange-banded specimens from Éclépens in the Jura. There is a specimen in the National Collection labelled "Germania," with the basal band and the light spot almost black, in which the upper side has broad tawny dashes inside the outer line, and a faint tawny suffusion over the fore wings. There are also among those from Germany some of both sexes which seem to me to belong to *britomartis*, and of which one regrets not to have more data.

The specimens of *dictynnoides* with which I am acquainted are somewhat few from which to make generalizations; they consist only of some ten specimens sent to me by Freiherr v. Hormuzaki, of the few in the National Collection, and of the specimens, again few in number, brought by Mr. Sheldon last year from the Tatra, the latter, however, being in first-rate condition. These, however, vary considerably on the upper side in the extent of their dark suffusion, especially on the hind wing.

I have, for example, one female in which only a single row of spots of the ground colour, *viz.* that within the inner line, remains, and a male with only the same row of spots and an intimation of a few more within the extra line. Many of them, however, approach the darker forms of *britomartis* on the upper side, and occasionally are not much darker than dark specimens of *athalia*. Mr. Sheldon has a female beautifully variegated on the upper side, reminding one of the best Bouveret or Weesen *dictynna*. The under side seems to vary less, having always a general look of *athalia*, the *dictynna* spots being always entirely absent; the outer portion of the central band is, however, almost always much broader than the inner, and I have one female in which, by reason of the light colour and total lack of division in this band, a distinct reminder of *deione* is afforded, which is, oddly enough, enhanced by the somewhat triangular shape of the light spot. The colouring of these light bands is, however, generally somewhat lighter than is usual in *athalia*, especially in the male.

Asteria, when regarded in detail, is by no means so constant as I supposed when writing my 'Butterflies of Switzerland, &c.' It is often much suffused on the up. s. almost to the extinction of the ground colour, while in other specimens the lines and nervures are very clear, giving quite the appearance of a very tiny *aurelia*. The approach of *varia* female to *asteria* has already been noticed; the converse is much more rarely the case, but both male and female are sometimes wonderfully close to *merope* on the up. s. It is, I imagine, the nearest approach to the ancestral Melitæid form. On the un. s. there is occasionally an indication of the second marginal line, but as a rule the characteristic absence of this is complete. In many cases the narrowness of the dark bands and the lack of division in the central as well as in the terminal band gives a very albinistic effect to the un. s.; the breadth of the dark bands is, however, very variable, as is also their colour; indeed, in the latter respect, *asteria* is quite as variable as any others of the group.

On p. 8 of the 'Entomologist' for this year I noticed Oberthür's var. *nevadensis* of *deione*. Lately, however, Mr. Powell, of Hyères, has drawn my attention by letter to the fact that Oberthür has since, in the third part of his 'Etudes,' pp. 251, 252, declared his conviction that the form there described is either a race of *athalia* or a new species altogether. Having no material on which to found an opinion, it is impossible to express one, further than by saying that from all that is known of the distribution of *athalia*, it is not likely that any form of it is to be found in the South of Spain. Certainly *nevadensis* would form a strong contrast to other southern Spanish forms of *deione*, but, then, so does *vernetensis* to other Pyrenean forms of *dictynna*.

To another point I must also briefly refer, *viz.* to Dr. Chapman's note on the Reazzino *Melitæa* in the March number of the Ent. Record, p. 71. Those who have followed my papers on this group will be aware of the grounds on which I pronounced this to be *britomartis*, Assmann. They still appear to me to be amply sufficient, which I cannot say for the grounds of Dr. Chapman's "correction." I shall, however, take the whole question of the genitalia of the group next, explaining my attitude towards the whole question, and the uses and abuses to which, in my opinion, this method of determination of species may be put, as illustrated by the group at present under discussion.

(To be continued.)

SOME NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

Diacrisia magna, sp. n.

Head and thorax creamy white, the latter spotted and striped with dark brown; prothorax edged with crimson; abdomen crimson above, ochreous grey beneath, dorsal spots blackish. Fore wings creamy white with dark brown, almost black. Markings disposed as follows: an almost triangular spot on costa towards the apex; a longitudinal stripe from the base, of uniform width to the blackish discoidal spot, thence expanded into a large triangular patch enclosing a small triangle of the ground colour on the outer margin; a large patch along the inner marginal area. Hind wings pale yellowish buff, the hairs towards the base crimson tinted; discoidal and two large spots near the anal angle blackish, between the latter there is a small blackish spot, and two others lie on the outer margin above the middle. Expanse, 74 millim.

Collection number, 1772.

Two males from Rantaizan, May, 1909. Taken at light.
Hab. Formosa.

Arguda formosæ, sp. n.

♂. Fore wings reddish ochreous, with a small dark ringed white spot at end of the discal cell; postmedial line and the veins beyond leaden grey; the outer margin clouded with dark leaden grey; beyond the postmedial line (which is almost parallel with the outer margin) there is a dusky, crenulated, transverse line. Hind wings reddish brown, darker and mixed with leaden grey on outer area, paler on the costal area. Under surface reddish brown, paler on the inner margin of each wing; the markings of the fore wings as above but thicker; on the hind wings the ante- and postmedial lines are blackish, and the latter is irregular. Expanse, 50 millim.

Collection number, 1184.

Two male specimens, Kanshirei, March, 1908; 1000 feet. Taken at light.

Hab. Formosa.

Metanastria albisparsa, sp. n.

♂. Head and thorax reddish brown; patagia thickly mixed with whitish; body rather paler reddish brown. Fore wings reddish brown, sprinkled with whitish scales on the veins; along the inner marginal area are three oblique dark streaks representing transverse lines, and these are whitish edged; a white discal dot, and beyond this is a dusky, interrupted streak running towards apex. Hind wings brown. Under surface brown.

Female paler, especially the hind wings, and the patagia are whiter.

Expanse, 58 millim. ♂; 82 millim. ♀.

Collection number, 1178.

Three specimens—two males, one female—from Arizan (7300 feet), August, 1908. Taken at light.

Hab. Formosa.

Callimorpha albipuncta, sp. n.

♂. Fore wings deep bronzy-green; a white spot in the discoidal cell, and a smaller one below it; seven white spots on the outer margin, three, four, and six rather nearer the margin than the others, spots one and seven minute. Hind wings bluish, costa broadly fuscous from base to beyond the middle. Fringes of all the wings black. Under side similar to above, but the fore wings are bluish. Head and palpi crimson, marked with bronzy-green; thorax bronzy-green, inner edge and front of patagia crimson. Body crimson, with a velvety black patch on the back of each segment, the fourth and fifth confluent, and the seventh small, and black spots on the sides; the under side black except the last segment.

♀. Agrees with the male, but has only four white spots on the outer margin of the fore wings, the first, third, and seventh being absent.

Expanse, 88 millim.

Collection number, 1175.

One example of each sex from Arizan, August 15th, 1908; 7300 feet. Taken at light only. Has a slow, heavy, fluttering flight.

Hab. Formosa.

Cypa (?) *formosana*, sp. n.

♀. Head and thorax reddish brown finely mixed with greyish; abdomen rather paler. Fore wings violet-grey sprinkled with reddish brown scales; there are five dark brown transverse lines, the first is not well defined, the second and third are outwardly angled at cell, the fourth is rather oblique, and the fifth is wavy; the space between lines three and four reddish brown except near the inner margin; on the outer margin there is a brownish crescent-shaped patch below the apex; fringes brown marked with white between the veins. Hind wings obscure reddish, fringes white marked with brown at ends of the veins. Under side obscure reddish suffused with greyish; the fore wings are bordered with reddish brown, inwardly limited by a brown, slightly wavy line; the hind wings have two brown lines, the first medial, the other limiting the reddish brown outer border. Expanse, 56 millim.

Collection number, 1673.

A female specimen from Taiko (2000 feet), October 8th, 1908.

Hab. Formosa.

Phalera obscura, sp. n.

♂. Head reddish brown; thorax grey with a dark brown patch above, marked with reddish in front. Fore wings greyish, finely stippled with blackish; antemedial and postmedial lines rather obscure, before the latter are three fairly distinct, wavy, blackish lines; submarginal line represented by a series of black dots; reniform and orbicular mark outlined in white; apical patch obscure dark purplish brown. Hind wings fuscous grey, the abdominal area clothed with long fuscous hair. Under side greyish, basal half of each wing suffused with fuscous. Expanse, 56 millim. ♂; 64 millim. ♀.

Collection number, 1183.

Three male specimens and one female from Kanshirei, April, 1908. The female is rather rubbed, but seems to agree in colour and markings with the male.

Hab. Formosa.

Tarsolepis taiwana, sp. n.

♂. Head dark brown; thorax pale brown transversely marked with dark brown; metathorax and abdomen dark brown, segmental divisions pale brown. Fore wings ochreous brown streaked with darker, outer margin broadly blackish mixed with grey, tapered to apex; four brilliant silvery marks, the two largest placed as in *T. remicauda*, Butl., a smaller one on the inner margin, one above the lower large mark and united with it by a slender silvery line; the area enclosing the silvery marks is streaked with dark brown. Hind wings ochreous brown clouded with blackish on the inner two-thirds; a blackish spot at end of the cell. Under side ochreous brown, suffused with blackish below the cell and towards the inner angle of the fore wings; hind wings rather paler, with a black dash in the cell, and a black spot at end of the cell; undulated postmedial line brown. Expanse, 62 millim. ♂; 76 millim. ♀.

Collection number, 1773.

One example of each sex from Rantaizan, May, 1909. Except in its larger size the female agrees with the male.

Hab. Formosa.

Pidorus marginatus, sp. n.

♂. Fore wings pale fuscous brown, the marginal edges black, bordered inwardly with crimson-red except on the inner margin; apical patch black. Hind wings yellowish brown, margined with black broadest at outer angle, and inwardly clouded with crimson-red; the abdominal area fuscous brown. Under side similar to above but with more crimson-red. Expanse, 34 millim.

Collection number, 706.

Six males and one female taken at Daitozan (8500 ft.), Sept. 11th, 1906.

Hab. Formosa.

Erasmia picturata, sp. n.

♂. Fore wings white, basal two outer thirds blackish, veins whitish; the basal third is traversed by three bands, the central one yellow, and the others metallic blue; the costal portion of the blackish outer third extends to the middle of the wing and encloses a round spot of the ground colour. Hind wings white, broadly bordered with blackish on outer margin, the edges of this border, and the veins, powdered with metallic blue. Fringes of all the wings whitish. Expanse, 56 millim.

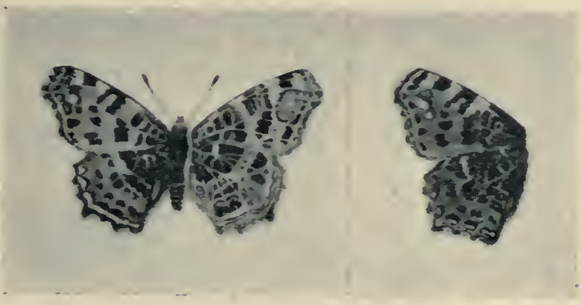
Collection number, 1195.

One male specimen from Suisha (Lake Candidius), October 1st, 1907.

Hab. Formosa.

VARIATION OF *A. LEVANA*, L.: COMPARATIVE DESCRIPTION AND POSSIBLE SIGNIFICANCE OF THE WING MARKINGS IN *LEVANA*.

By T. Reuss.



A. levana and *A. levana* ab.

On February 6th last I bred the above aberration* of *A. levana* from a *summer pupa*,† which should have produced var. *prorsa* last August, but had hybernated instead. It emerged after being taken indoors for some days and then given an "early spring" with temperatures of 8°–15° C. at night, and 16°–25° C. by day, from January 29th onwards. The aberration exhibits exceptionally large blue markings (lunules) on the upper side of the orange black-spotted hind wings, and in the median and anal parts of the wing these blue markings form into a band, such as, in the Entom. vol. xlii. p. 311, I had suggested might decorate the wings of *V. urticæ*. There are blue lunules also on the forewings near the apex. The *levana* under side has the broad violet colour patches which in the *large-sized Araschnia bureyana*, Brem., var. *thibetana*, Obth. (which is facially connected with *levana* by *bureyana* and the *large levana*-variety of the Sayan mountains), help to form an *apical ocellus* reminding one of the ocellus in the fore wings of *V. io*. As the markings of the upper and under sides are *interchangeable* to a certain extent, the comparison is, perhaps, not quite vain. Two of the ocelli in the anal wing parts are shaped strikingly like those of *P. atalanta-indica*, and also otherwise the under side facies pictures details characteristic of the subtropical or tropical Pyrameid group of Vanessidæ—for instance, of *indica-carye-terpsichore-virginiensis-myrinna*.*

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* The figure is somewhat enlarged.

† One of twenty-one summer pupæ from wild Mecklenburg larvæ that were kindly sent to me by Mr. Merrifield.

On the other hand, the upper side resembles the "tortoiseshell" forms of the Vanessids, which are characteristic of northern climatical conditions, such as the many forms of *c-album-urticæ* (*milberti*), *xanthomelas-polychloros*. Mixed with these markings, the white Pyrameid spots show brightly on the fore wings, but these spots, though changed in appearance, occur also in the several "tortoiseshell" species or their aberrations, and especially in *V. io*. The third costal spot in *levana* is also—together with the distribution of yellow along the costa—*ioform*. I would suggest that the small-sized polymorph *A. levana*, with its whitish-ringed body and light-veined *harmoniously coloured* under side, pictures a comparatively primitive stage of facial development in the Vanessidæ, that, indeed, the very dark under sides of, for instance, *urticæ, io, polychloros*, are of *comparatively* recent origin and representative of high specialization in adaptation to the habit of these forms *to hybernate in the imago state*, for all the Vanessidæ that hybernate in earlier stages of development, and the non-hybernating tropical Pyrameid species, particularly those of South America, preserve the light-veined, fine-toned under side facies, which, among rich vegetation and in every kind of light, may be supposed to be more in harmony with its surroundings,† and therefore, also, more protective than a plain dark under side. I have, indeed, often found that *V. io*, for instance, may appear as one of the most conspicuous of insects by its black-brown under side. Perhaps the (polymorph!) *A. levana* with its next relatives comes very near picturing to us what the ancestral form of the Vanessidæ was like. If, then, the ancestors of *levana* were also "the ancestors of *V. urticæ* and *V. io*" (see *antea*, pt. 2, p. 58), then the latter species would have separated (1) from *levana* (which hybernates in the pupal stage) *by adopting the habit of hybernating in the imago stage*, and (2) from each other by different reaction to climatic influence (Standfuss), *V. urticæ* remaining smaller and many-brooded under temperature conditions which leave the larger *V. io* single-brooded.

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* See 'Ent. Rec.,' pt. 1, pl. 1, 1910, "Comparative View of Vanessid Species," for text see pts. 3 and 4.

† The wing parts of a butterfly, which are exposed when the insect is at rest, most distinctly show a tendency to "colourphotograph" their surroundings (Poulton, Standfuss, Wiener). The influence of colour on the wing-cells may be either direct or indirect through the eyes of the butterfly. Thus the colours and even the patterns of *favourite* resting-places, flowers,

(To be continued.)

TRANSPARENT GELATINE SHEET: A MEDIUM FOR MOUNTING THE SMALLER COLEOPTERA.

By F. H. Moore.

The preference which coleopterists show for pinning their specimens, whenever size permits, argues a defect in the carding method.

An obvious disadvantage of *carding* is the concealment of the insect's ventral side, and since *pinning* is out of the question for a vast number of small Coleoptera, the advantages of a transparent medium for mounting must be evident; indeed, for species bearing peculiar ventral characters, such a medium becomes very necessary.

Now a transparent gelatine mount permits of a clear inspection of one's specimens dorsally and ventrally, and obviates the risks to which fragile insects fixed on pins are exposed. The material is exceedingly clean and easy to work with, and no gum is required in the actual process of mounting.

The *modus operandi* is as follows:—Set the specimen in the ordinary way by gumming on card. When set, remove from the card, cleanse, dry, and place on a gelatine mount. Then proceed to touch down the tarsi and antennæ with the point of a camel's-hair brush dipped in warm water, and allow to dry for

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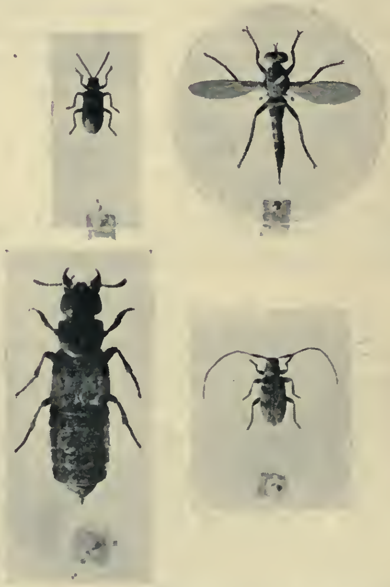
&c., could be "photographed." And thus, also, in another sense, the resemblance of the under sides of *V. urticæ* and *V. io* to the dry twigs and dead leaves of winter could be explained, while the *suppression of colour development in the under sides* would account for the *transference of brilliant colours to the upper sides* and the reduction of the *black* upper side markings. *V. io* and *antiopa* which have the blackest under sides exhibit the minimum amount of black in their upper sides.

a minute or two, when the insect will be found firmly and cleanly attached.

Some difficulty may be experienced with the larger species, if their tarsi do not lie evenly on the mount at all points; in such cases the insect should be relaxed, if necessary, and care taken when mounting to fix each tarsus firmly before proceeding to the next.

Soft-limbed species may be mounted without previously being set.



C. maxillosus, *L. nebulosus*, *L. melanopa*, and *M. atricapillus*, mounted on gelatine (enlarged).

A glance at the illustrations (somewhat enlarged) of *L. melanopa*, *C. maxillosus*, and *L. nebulosus* on gelatine mounts, and a pinned specimen of *M. atricapillus* on a disc of the same material, will give some idea of the pleasing results obtainable by the gelatine method, which is especially useful for smaller species than those shown in the photographs.

No doubt Diptera, Hemiptera, &c., could easily be mounted on gelatine without pins, but as there are few insects abroad at the moment of writing I am unable to make the experiment.

I might mention that Messrs. Watkins & Doncaster have undertaken to supply these mounts.

NOTES AND OBSERVATIONS.

Early Appearance of a Dragonfly.—I was fortunate enough to get a good view of a dragonfly on Easter Sunday (March 27th), which appears to be a most extraordinarily early date for any of the Odonata. My father was accompanying me, and also saw the insect, which was flying briskly about on a sheltered bank in the bright sunshine about midday at Hever in Kent (some nine miles south-west of Tunbridge Wells). On mentioning the fact to Mr. Herbert Campion, a well-known authority on dragonflies, I was given to understand that a dragonfly in March was worth recording, especially as there does not appear to be another instance recorded. I cannot do better than quote from a letter on the subject received from Mr. Campion, to whom I must tender my very best thanks. He writes:—"I find I have no note of any observation or capture of any British Odonate earlier than April 22nd, 1900 (*see* the 'Entomologist' for 1901, p. 65). On the date named some dragonflies were seen, but not taken, and were considered to be *Libellula quadrimaculata.* This identification is rendered probable by the fact that the same species was taken on April 25th, 1894. *L. depressa* has also occurred in April (April 28th, 1902). . . . I rather gathered from your remarks, however, that you considered your dragonfly to belong to the Æschnid series. The only spring Æschnid is what is generally known as *Brachytron pratense* (recte *B. hafniense*), but I have no positive record for that earlier than May 5th. Such *Agrioninæ* as *Pyrrhosoma nymphula* and *Enallagma cyathigerum* have also occurred in April, but these, of course, are small species." Thus it will be seen the only *large* spring dragonfly is the Æschnid *B. pratense.* Assuming the insect seen to belong to this species (and it certainly was quite as large), the earliest records are—*vide* "British Dragonflies" (W. J. Lucas), p. 176—"seen at Egham, but not captured, April 29th, 1893 (C. A. Briggs); captured at Dover, May 5th (C. G. Hall); May 14th (W. J. Lucas)." There does not appear to be any reason why dragonflies should not appear more commonly after such mild weather as we experienced during the latter half of March.—Geoffrey Meade-Waldo.

Note on Attacus edwardsi (White).—In the May, 1909, 'Entomologist,' I had a note on the pupating larva of the above. The secret of this particular larva was that it was infested with a dipterous parasite, feeding internally, and which emerged during May. This winter I have had a further consignment of wild collected cocoons of *Attacus edwardsi*, and I have a few more of this dipteron in pupæ and hatching. I shall be glad to forward them as long as they will last to any dipterists who send small box and postage. I cannot, however, offer any hope that this species is rare, as over twenty per cent. of the imported Himalayan cocoons of *edwardsi* were infested. I retained, however, some of the infested larvæ for distributing the dipteron. I have also a few living dipteron cocoons, ex the Nevada *Papilio eurymedon* to give away—Diptera not interesting me, as I only collect the Saturnidæ moths.—J. Henry Watson.

GYNANDROUS LYCIA (BISTON) HIRTARIA.—Amongst a number of *Lycia* (*Biston*) *hirtaria* I have been taking in this neighbourhood from trunks of lime (linden) during the last few days, one appears to be worthy of notice. The fore wings are of the normal female outline and markings, as also are the hind wings, except that they are rather more densely scaled with black. Abdomen of female character, but much less in girth than usual (probably from the absence of developed ova), with ovipositor slightly protruding. Right antenna female, but the left is pectinated as in the male, though rather less strongly than usual. It is a fairly well-developed example, but rather small for a female, being only 1½ inches in expanse. C. G. Barrett's work refers to a similar gynandrous specimen from the Bond collection, which was taken in Regent's Park.—WM. G. PETHER; 4, Willow Bridge Road, Canonbury, London, N., 23rd April, 1910.

LIFE HISTORY OF PAMPHYLA FIARA.—As nothing has yet been published of the early stages of this butterfly, and as the change in colour of the larvæ are very great, I think a description of the same may be of interest to collectors of South African insects. The egg, which is yellow-green in colour, is laid upon the upper side of the leaves of the *Strelitza* (wild banana), and the larva, when it emerges, is brilliant red in colour, with a black head; it immediately rolls itself up in a small piece of the leaf, leaving the ends open, and feeds upon the edges. The first moult takes place about the fourth day; the larva is then dark-brown in colour, and the head still black; it makes a new house this time, turning a piece of the leaf flat over itself and fixing the sides down with a strong white silky web. It is some three-quarters of an inch in length before the second moult takes place, in about five days. The larva is then a dark green in colour, except the head, which is black, and the last segment which has a brown, hard patch above the last claspers; the spiracular spots are orange-red in colour. The third moult takes place in about six days and the larva is similar in appearance to the previous stage. The fourth moult takes place about seven days later; the larva is then very pale green in colour, and the intestine can be plainly seen through the skin; the head is then very large and the colour half black and half white, while the last segment is black upon the upper half, and the spiracular spots are bright orange-red in colour. When full-fed this larva is two and a quarter to two and a half inches in length, and is very strong, being able to cement firmly together the two sides of a whole leaf, which is often twenty-four to thirty-six inches in length. When about to pupate, the larva rolls itself up, generally in a dead portion of the leaf, fixing itself entirely all round with silk, turns a pale pink colour, and in about seven days it changes to a light brown pupa; it is then covered with white powder which easily rubs off. The time before the butterfly emerges varies greatly: in one instance only twelve days elapsed, but others have been twenty-six days in the pupal state. I found the eggs at Pinetown, Natal, on February 4th of this year, this is the second new larva of a butterfly I have found there, in twelve months. Last year in the same locality I got *Capys disjunctus* (see Entom., 1909, p. 184).—G. F. LEIGH, F.E.S.; Durban, Natal, March 26th, 1910.

Entomological Club.—A meeting was held at the Savage Club, Adelphi Terrace, on April 20th, 1910, Mr. H. Rowland-Brown in the chair. Other members present were Messrs. Adkin (R.), Donisthorpe, Hall, and Verrall. Among the nine other guests were the honorary members Messrs. Jones (A. H.) and Sich.

Erratum.—*Antea*, p. 78, lines 7–8 from top. For "larger and more robust" read "smaller and less robust."

CAPTURES AND FIELD REPORTS.

Biston hirtaria in Inverness-shire.—Early in April I came across the above species *in cop*. Both specimens were large and of a very dark greenish brown, and black markings very strong. At first sight I was doubtful as to what species it was; however, after examination, I found it to be the above-named species. I am not aware whether *hirtaria* has been recorded from Inverness-shire before.—Robert Lawson; Croft Park, Craigie, Perth, N.B.

Early Occurrence of Agrotis puta.—Seeing Mr. Jackson's note on the occurrence of *Agrotis puta* in May (*antea*, p. 66), the following may be of interest as throwing some light on the question as to whether this insect is double-brooded or not. I find on looking at my diary that *Agrotis puta* has occurred here at sugar in May and June in 1905, 1907, 1908, and 1909. In 1906 I did not do any sugaring in May, and in June only on the 9th, 16th and 23rd. I have also taken the species in August in 1904 and 1905, so that I should think it is almost certainly double-brooded in this locality. My earliest date is in 1907, May 21st (one male and one female), and in that year I also took specimens on June 10th, 11th, and 19th. —Guy E. H. Peskett; Simla, Preston, Brighton, Feb. 22nd, 1910.

Notes from Haslemere for 1909.—For various reasons my collecting in this neighbourhood last year ceased at the end of July, but in spite of the unpropitious weather, one or two things may be worth recording. On the whole, sugar was a failure, and save for a bright exception here and there, the same may be said of the lamps. The most noteworthy thing was the immense profusion of the commoner larvæ on the oaks, sallows, and hazels about the end of May: the leaves were stripped entirely off the trees in many places, and in some instances second crops were noticed later on. Other facts worth recording are that *Calestrina argiolus* appeared in great profusion during May, that the larvæ of *Vanessa io* and *V. urticæ* were swarming everywhere up to about the end of July, and that many species were later than usual in appearance.

A few ova of *Pieris napi* were taken on *Alliaria officinalis* on May 30th. The resultant larvæ, which appeared on June 7th, fed up quickly, and had pupated by July 6th. I took them to Switzerland with me, thinking they would emerge in August, but they have passed the winter as pupæ. Ova of *Euchloë cardamines* found on the same day also produced larvæ on June 7th, and pupated on July 5th. This species did not seem so plentiful as usual, and very few females were observed. Females of *Vanessa urticæ* were seen ovipositing on April 15th, and the first young larvæ were noticed on May 6th, from which date until the end of July almost every patch of nettles swarmed with them. Many full-grown larvæ were taken for the purpose of studying their ichneumon parasites, and three species of these were obtained. In July the larvæ of *V. io* were in great profusion too, and one ichneumon was obtained from these. A full-fed larva of *V. polychloros* was taken on a road near some elm trees, and this duly pupated, but an ichneumon was the only result. This is, however, the first time I have noticed the species here. *Limenitis sibylla* seems to be fairly well established in the locality, and several specimens of *Apatura iris* have been seen. It may be remembered that I had ova of *Cænonympha pamphilus* on June 15th, 1908, from which larvæ appeared on June 28th. None pupated that year, but those that survived the winter, eating continuously, though very sparingly, the whole time, began to pupate on May 12th, 1909, and the resultant imagines came out on June 5th, *i. e.* only ten days short of a year to complete the cycle. Larvæ of *Thecla quercus* emerged from the egg on March 23rd, but died owing to the impossibility of procuring oak-buds for them. Full-grown larvæ were plentiful during the early part of June, and imagines from July 22nd onwards. Two complete broods of *Rumicia phlæas* were bred from ova deposited by captured females, but no striking varieties were obtained. The dates of emergence were:—First brood: ova, May 21st; larvæ, May 31st; pupæ, July 10th; imagines, July 27th. Second brood: ova, June 17th; larvæ, July 3rd; pupæ, August 6th; imagines, August 21st.

Ova of *Lycæna ægon* appeared on April 8th, when they readily ate the flowers of gorse. Later they were transferred to broom flowers, and later still to bird's-foot trefoil. But they fed very slowly, and the first date for pupation was August 2nd. The pupæ were small and they unfortunately shrivelled up and died. A good batch of ova of *L. icarus* was obtained on June 16th, and the larvæ fed from June 26th till August 15th, when the first pupated; and imagines began to appear on September 1st. It was noticed that a few larvæ far outstripped the rest, which seemed to be retarded in their growth, and never reached maturity.

During a week-end visit to Dorking at the beginning of May, a search was made for full-fed larvæ of *L. bellargus*, and about a dozen were found. They pupated on May 13th, and imagines appeared from June 9th to June 11th—nine females and three males. *C. argiolus*, first seen on May 8th, oviposited May 21st; the larvæ appeared in eight days, and began to pupate on July 8th, producing imagines July 26th.

A female *Tæniocampa miniosa* was taken at a lamp, and she obliged with a large number of ova on April 17th; the resultant larvæ, which emerged on May 2nd, fed up very rapidly, especially after their last moult, and went down on June 2nd.

A visit to some sallows during the night of April 28th yielded a number of full-fed larvæ, which began to go down the next day, and the following species resulted from them later on:—*Boarmia repandata*, June 13th; *Aplecta tincta*, June 15th; *Noctua brunnea*, June 18th; *N. ditrapezium*, June 24th; *N. baia*, July 8th; and on July 18th *Cleoceris viminalis* came out from larvæ beaten out of sallow in the daytime. Some sections were removed from sallow trees infested with *Trochilium crabroniformis*, and imagines began to appear on June 15th.

A female *Phragmatobia fuliginosa*, taken on July 13th, laid a quantity of ova, and the larvæ, which came out on July 21st, look quite healthy at the time of writing. The larvæ of *Calymnia trapezina* were a perfect pest at the end of May, in company with other common things. Larvæ of *Aspilates strigillaria*, obtained on heather, pupated on May 8th, and produced imagines on June 11th, a fortnight before they were observed wild. Some ova of *Melanippe sociata* and *Coremia ferrugata* were obtained, and the resultant larvæ fed together on bedstraw from June 20th till July 15th, the imagines appearing on July 30th and August 1st respectively.

The above partially represents, but by no means exhausts, an account of my breeding for the year, which may be considered fairly satisfactory. One night at the lamps stands out among a host of bad ones—June 9th—when several specimens of *Drymonia trimacula*, in first-class condition, were taken, as well as *Acronycta leporina*, *Demas coryli*, *Notodonta ziczac*, *Drepana binaria*, *D. falcataria*, *Amphidasys betularia*, and many others. All these were taken from one lamp during an hour's stay between eleven and twelve. Many good geometers were taken by day, notably *Metrocampa margaritaria*, in great numbers, *Eurymene dolabraria*, *Geometra papilionaria*, *Phorodesma pustulata* (for the first time in this locality), *Acidalia bisetata*, *A. dimidiata*, *A. subsericeata*, *Eupithecia pumilata*, *Thera firmata*, *Melanthia albicillata*, and *Coremia designata*; and in addition to those mentioned above, the following were taken here for the first time:—*Xylophasia rurea*, May 29th; *Caradrina morpheus*, June 29th; *C. alsines*, July 20th; *Tæniocampa populeti*, April 16th; *Tephrosia punctularia*, June 8th; *Acidalia sylvata*, July 20th; *Eupithecia linariata*, July 10th; *E. castigata*, June 1st; *E. minutata*, July 20th; *E. abbreviata*, May 8th; *Triphosa dubitata*, May 20th.—F. A. OLDAKER; Haslemere, February 14th, 1910.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 2nd*, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—It was announced that the Society would be represented at the forthcoming Jubilee Celebration of the Entomological Society of Russia, by Dr. Malcolm Burr, D.Sc., F.L.S., F.Z.S., &c., and that he would deliver an address of congratulation.—Mr. John C. Eales-White, of 47, Chester Terrace, Eaton Square, S.W., was elected a Fellow of the Society.—Mr. W. G. Sheldon exhibited various forms of *Agriades* (*Polyommatus*) *corydon* from Southern Europe, including *A.* var. *arragonensis*, and its form *cærulescens* from Albarracin, Spain; also a pair of *Brenthis selene* from La Granja, and a pair of *B. hecate* from Hungary, showing the remarkable approximation of the two species in the markings of the wings.—Mr. H. St. J. Donisthorpe brought for exhibition a case containing a small nest of about thirty to forty hermaphrodite living examples of *Formica rufibarbis* var. *fusco-rufibarbis* from Whitsand Bay, August, 1909, into which had been introduced a queen of *Formica rufa* from Nethy Bridge (May, 1909). The queen had been accepted by the other ants in a few days.—Mr. C. O. Waterhouse, on behalf of Mr. J. C. Moulton, of the Sarawak Museum, exhibited a Longicorn beetle of the genus *Chlorydolum*, in which the right antenna was much shorter than the left. The specimen appeared to be a male in every respect except in the length of the right antenna, the joints of which were a trifle shorter than those of a female. Mr. Moulton was inclined to think that the specimen might be gynandromorphous. Mr. Waterhouse suggested that it might rather be regarded as a malformation.—Mr. W. E. Sharp exhibited an example of *Calathus mollis*, having the right anterior tibiæ and tarsus in triplicate. He said that such reduplication was not uncommon, but that it was seldom so perfect in detail.—Mr. L. W. Newman showed a case containing the following forms of *Anthrocera hippocrepidis*, all taken in June, 1908, in one small field in the neighbourhood of Bristol: (*a*) analogous to *A. filipendulæ* var. *chrysanthemi*, (*b* and *c*) analogous to *A. filipendulæ* ab. *flava*, Robson, and a pink form, with (*d*) an example with yellowish spots, otherwise normal. Also a specimen of *A. lonicerœ* captured at the same place, with the markings broadly confluent.—Mr. G. Bethune-Baker brought for exhibition three nests of a species of Lasiocampid from Mount Elgon, Albert Nyanza, belonging to the same group as *Thaumetopœa processionea*. He had been consulted relative to the possibilities of using the silk of which the long pouch-like "nests" were constructed. Mr. G. A. K. Marshall said that they belonged to a species of *Anaphe*.—Professor E. B. Poulton, F.R.S., read a "Preliminary Note on Mr. A. D. Millar's experimental breeding of forms of the Nymphaline genus *Euralia* in Natal," by Mr. Roland Trimen, M.A., F.R.S., and exhibited examples of the species and forms referred to. He said that Mr. Millar was greatly to be congratulated on his success in obtaining the long-wished-for proof that *Euralia wahlbergi* and *E. mimæ* were forms of the same species. Professor Poulton also exhibited a set of six *Euralia anthedon*, Doubl., and four *E. dubia* from Lagos, the western representatives of *E. wahlbergi* and *E. mimæ* respectively, giving it as his opinion that after the proof obtained by Mr. Millar, the western butterflies were also the dimorphic forms of a single species. The following papers were read:—"Third Paper on the Tetriginæ (Orthoptera) in the Oxford University Museum," by J. L. Hancock, M.D. "Descriptions of New Algerian Hymenoptera-Aculeata (*Sphegidæ*)," by the late Edward Saunders, F.R.S., and the Rev. F. D. Morice, M.A. "On *Zizeria*, Chapm. (= *Zizera*, Moore), a group of Lycænid Butterflies," by

Dr. T. A. Chapman, M.D., F.Z.S. "Further Notes on two *Osmia* species of the *Adunca* group," by the Rev. F. D. Morice, M.A. "A Few Words respecting Insects and their Natural Enemies," by Arthur G. Butler, Ph.D., F.L.S., F.Z.S., M.B.O.U. The Rev. F. D. Morice M.A., then delivered an address "On the Saws of Saw-flies," illustrated by many lantern slides prepared and arranged by him.

Wednesday, March 16th, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—Dr. Malcolm Burr, D.Sc., gave an account of his reception in St. Petersburg by the Entomological Society of Russia, to whom he had presented the address of congratulation, published at the last meeting.—Mr. Edmond Wace Carlier, M.S.C., M.D., F.R.S.E., of the University, Birmingham; Mr. Herbert Alfred Green, of the Central Fire Station, Durban, Natal; Mr. Philip Harwood, of 23, Northgate End, Bishop's Stortford; Mr. J. Henderson, of Clifton, Ashbourne, Derby; Mr. Lionel Leslie Jacobs, Shelford, Copers Cope Road, Beckenham; Mr. William Laidlaw, 73, Endsleigh Gardens, Ilford, Essex, and 74, Great Tower Street, E.C.; Mr. H. S. Leigh, of the University, Manchester; Mr. F. Graham Millar, of "Seafield," Batu Tiga, Selangor; Mr. Francis Allcock Oldaker, M.A., of the Red House, Haslemere; Mr. Aiyappa Raman Pillai, Trivandrum, India, and 13, Buccleuch Place, Edinburgh; Professor Reginald Crundall Punnett, M.A., of Gonville and Caius College, Cambridge; Mr. James M. Williams, F.R.Scott.G.S., of the Howard Motor Garage, Cardiff, and Canford Cliffs, Hants, were elected Fellows of the Society.—Mr. H. St. John Donisthorpe exhibited examples of *Cremastogaster sentellaris* hermaphrodites, *Colobopsis truncatus* hermaphrodites, and a beetle, *Formicornus pedestris*, a good mimic of the latter ant, all taken in virgin cork at Kew, May, 1909.—Commander J. J. Walker, R.N., a living specimen of *Holoparamecus caularum*, Aubé, taken commonly in refuse haystack at Water Eaton, Oxon, on March 14th.—Mr. H. M. Edelsten brought for exhibition photographs of the anal appendages of *Tapinostola hellmanni*, *T. concolor*, and *T. fulva*, showing their remarkable similarity; also ova of the same species *in situ*. The photographs were the work of Mr. H. Main and Mr. A. E. Tonge.—Mr. G. W. Nicholson showed a specimen of *Dyschirius angustatus*, Ahrens, from Littlestone, Kent, taken in July, 1906; two specimens of *Bembidium 4-pustulatum*, Dj., taken at Pulborough in June, 1909; and two specimens of *Conosoma bipunctatum*, Gr., found by Mr. Jennings and himself at Broxbourne, Essex, in January of this year.—Dr. T. A. Chapman exhibited series of *Callophrys avis*, Chapm., bred this spring, together with series of *C. rubi* for comparison, and pointed out the principal superficial differences between the two species.—Mr. J. W. Tutt read a paper on the several forms of *Hydræcia* occurring in Britain, and illustrated the superficial differences where discoverable, and the marked difference in the anal appendages of the several species, *Hydræcia nictitans*, *H. paludis*, *H. lucens*, and *H. crinanensis*. He made an appeal to Fellows to try, during the coming season, to obtain eggs, larvæ and pupæ of the four British species for comparison, and to discover, if possible, structural differences in their stages, in support of those shown by the superficial imaginal characters, and those of the ancillary appendages in *H. nictitans*, *H. paludis*, and *H. lucens*, but more particularly to detect, if possible, differentiating characters in the early stages of the two species *H. lucens* and *H. crinanensis*, the genitalic characters of which are so entirely different in both sexes and yet whose facial characters so far appear practically indistinguishable. Excellent photographs of the genital organs of the four British species (both sexes), made by Mr. F. N. Pierce, were handed round for examination.—The Rev. C. R. N. Burrows, to whose research the discovery of *H. crinanensis* is really due, stated that he had little to add to what Mr. Tutt had said; it seemed to him amazing that two species showing so much difference as *H. lucens* and *H. crinanensis* in their genitalia, should present no definitely marked superficial character in the imago.—Dr. Karl Jordan considered that the four species, as proved by the differences in the genitalic structures, were abundantly distinct, and brought forward a parallel case among the Attacids.—Mr. J. C. Kershaw contributed a paper on "The Oothecæ of an Asilid (*Promachus*, sp.)."—Dr. T. A. Chapman, M.D., F.Z.S., read a paper entitled "*Xanthandrus comtus*, Namr., a Correction."—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society.—*March 2nd*, 1910.—Mr. A. Sich, F.E.S., Vice-President, in the chair. Mr. Sich exhibited specimens of *Coleophora troglodytella* bred from larvæ fed on *Achillea millefolium*, and also larvæ feeding on mignonette seeds, probably those of *Borkhausenia pseudospretella*.—Mr. R. Adkin, series of *Tæniocampa gothica* var. *gothicina*, selected from a large number of bred and captured specimens.—Captain Cardew, a bred series of *Pachnobia leucographa*, very dark in colour; a series of typical *T. gothica*, bred from var. *gothicina* parents; and specimens of *Phigalia pedaria* from Wimbledon, one taken on January 2nd, worn; two on March 18th, in good condition.—Mr. P. Barrett reported *Brephos parthenias* and *Gonepteryx rhamni* in woods near London.

March 10th.—Mr. A. Sich, F.E.S., Vice-President, in the chair.——Mr. West exhibited two cabinet drawers of the Society's collection of Coleoptera which he had just remounted and arranged.—Mr. Barrett, specimens of *Nyssia hispidaria*, *Phygalia pedaria*, and *Hybernia leucophæaria*, from Richmond Park, and noted that he took the first-named species in the same locality forty years ago, and that quite one-third of the last species seen were more or less crippled.—Mr. Lucas, the photograph of a very rare earwig, *O. lewisi*, from a specimen obtained in the Liverpool Docks (see p. 129).—Mr. Bonham, two bred, intensely black, females of *Nyssia hispidaria*.—Mr. L. W. Newman, an interesting series of *Anthrocera* species from Bristol, taken by Messrs. Smallcombe, including *A. hippocrepidis* var. *chrysanthemi*, a yellow form, a fine pink form, and a red form with yellow spots, with a confluent form of *A. lonicerœ*. He also showed a confluent specimen of *A. meliloti*, and reported that pupæ of a second brood of *Abraxas grossulariata* kept out of doors were still alive. The remainder of the evening was devoted to the exhibition of lantern slides by Messrs. Tonge, West (Ashstead), Lucas, Dennis, and Edwards, including series illustrative of the resting attitudes of insects, the crystals formed from various solutions, rare plants from the New Forest, details of insect structure, various plants attacked by galls, and the natural history and structure of the cockroach.—Hy. J. Turner, *Hon. Rep. Sec.*

RECENT LITERATURE.

Dermaptera (Earwigs): the Fauna of British India, including Ceylon and Burma. By M. Burr, D.Sc., M.A., &c. London. 1910.

Apart from its first-rate importance in connection with the Fauna of British India, there are two special ways in which this work will be of very great use to entomologists generally. For one thing, we have at last a satisfactory classification of the whole of the earwigs, the author treating them as he intends doing in the general revision and monograph of the earwigs of the world, which he has in hand. He is inclined to consider these insects as a distinct order (in which we scarcely agree with him) consisting of five families—Apachyidæ, Pygidicranidæ, Labiduridæ, Labiidæ, and Forficulidæ. The other feature of interest to all is the full, interesting, and very readable introduction giving the description and life-story of the earwig in general. The now well-known case of the jointed cerci of the immature Diplatys is adequately referred to. This, it appears to us, is one feature amongst others linking up the earwigs with other Orthoptera. The species described are one hundred and thirty-five in number, including two with a query; fifty-four of these are not represented in the British Museum. The book is illustrated by ten fine plates (one coloured), containing one hundred and four figures, and by sixteen figures in the text; it contains a full bibliography.

W. J. L.

A List of the Neuroptera of Ireland ('Proceedings' of the Royal Irish Academy, vol. xxviii. Branch B, No. 2). By J. J. F. X. King and J. N. Halbert. Dublin. 1910.

This publication of eighty-three pages, which is considerably more than a mere list, brings us up to date with the known distribution of the Irish Neuroptera in the older wide sense of the word. It appears that there are two hundred and forty species known as compared with three hundred and eighty-four for Great Britain; it is therefore clear that much work remains to be done. Specially interesting results may be expected from the south-west of the island, when that district comes to be systematically worked. Since the dragonfly *Somatochlora arctica* occurs there, what may not be expected? We note that the peculiar insect, *Psectra diptera*, has been found in Co. Wicklow, and that at last a scorpion-fly (*Panorpa germanica*), from Co. Cork, may be added to the Irish list. The paper contains a useful bibliography.

W. J. L.

List of the "Clyde" Copeognatha, or Psocidæ (from the 'Glasgow Naturalist'). By J. J. F. X. King. 1910.

Twenty-one species (out of forty-three known to be British) are here given, with their distribution as far as known.

W. J. L.

Smithsonian Institution. United States National Museum. Bulletin 63. "A Monographic Revision of the Coleoptera belonging to the Tenebrionide Tribe Eleodiini inhabiting the United States, Lower California, and Adjacent Islands." By Frank E. Blaisdell, Sr. Pp. i.–xi. and 1–524.

This revision of the Eleodiini has been based on a study of the primary characters, and, when possible, the mouth-parts; the data thus obtained being then correlated with the other known characters. It is the outcome of the author's labours during the past five years, in the course of which he has dissected about one thousand specimens, and studied the superficial characters of five thousand. There are eight genealogical diagrams in the text, and thirteen plates showing genital and other structural details of the Eleodiini.

United States Department of Agriculture. Bureau of Entomology:—

Technical Series, No. 16, part iii.: "Catalogue of Recently Described Coccidæ.—II." By J. G. Sanders, M.A.

Technical Series, No. 17, part i.: "The Genus Dendroctonus." By A. D. Hopkins, Ph.D.

Bulletin No. 58, part iv.: "The Southern Pine Sawyer." By J. L. Webb, M.S. Part v.: "Insect Depredations in North American Forests, and Practical Methods of Prevention and Control." By A. D. Hopkins, Ph.D.

Bulletin No. 77.: "Hibernation of the Mexican Cotton Boll Weevil." By W. E. Hinds & W. W. Yothers.

Bulletin No. 82, part ii.: "The Parsnip Leaf Miner. The Parsley Stalk Weevil. The Celery Caterpillar." By F. H. Chittenden, Sc.D. Part iii.: "The Lima-bean Pod-borer. The Yellow-necked Flea-beetle." By F. H. Chittenden, Sc.D.

Bulletin No. 83, part i.: "Bark-beetles of the Genus Dendroctonus." By A. D. Hopkins, Ph.D.

Bulletin No. 85, part i.: "The Lesser Clover-leaf Weevil." By F. M. Webster, M.S. Part ii.: "The Slender Seed-corn Ground-beetle." By W. J. Phillips.

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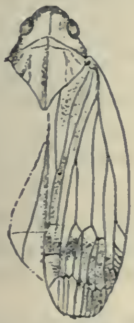
SOME INSECTS IN BALTIC AMBER.

By T. D. A. Cockerell.

The insects now described are chiefly of interest as showing the immense antiquity of many existing forms of insect-life. Although of Oligocene age, none of these species would excite any surprise in the modern fauna.

Homoptera.

Oliarus oligocenus, n. sp. (Fulgoridæ: Cixiinæ.)



Oliarus oligocenus, Ckll.

Length about 8⅔ mm.; head broad, rounded in front, not much produced; a delicate carina extends from near the level of the front of the eyes backward to the apex of the mesonotum; eyes prominent, not very large (smaller, for instance, than in *Cixius vitreus*); lateral carinæ of mesonotum delicate, with more or less of a double curve; exterior to the lateral carina is a straight groove; tegmina broad, obtuse, clouded with dark brown in the whole anal field, in the upper apical region, and an irregular band connecting these areas; nervures not punctate; no definable stigma; hind wings dilute fuscous.

The venation of the tegmina is not unlike that of *Lamenia*, which Kirkaldy holds to be a Cixiine. The subcosta and radius separate before the middle of the tegmen, but have a longer common stalk than in *Lamenia kulia*; the media leaves them about as in *Lamenia*; the cubitus branches at about the same level as the subcosta and radius, and has a long fork before joining any other vein; the anals are nearly as in *Lamenia*, *Dictyophora*, *Dicranotropis*, &c., but the first anal is modified apically, so as to become practically lost in a couple of strong cross-veins; the apical field is much smaller than in *Lamenia*, and the inner series of gradate veins is zigzag and little oblique. The head behind is very distinctly angled, as in *Oliarus*, and not as in *Cixius*. Among the species described from amber, this is rather similar to *Cixius insignis* and *C. succineus* of Germar and Berendt (1856), but it is clearly distinct from all.

Hab. In Prussian (Baltic) amber; purchased from Mr. Janson. The same piece of amber contains trichomes and an anther of *Quercus*, such as are figured by Conwentz.

DIPTERA.

Sciara meunieri, n. n. (Mycetophilidæ: Sciarinæ.)

Sciara prolifica, Meunier, Ann. Soc. Sc. Bruxelles, 1904, p. 65 (not of Felt, 1897).

Sciara electriphila, n. sp.

♂. Length nearly 3 mm. (head and thorax 1020 μ, abdomen about 1700); ferruginous, antennæ pale at base; antennæ 1900 μ long, 16-jointed, the middle joints cylindrical, four times as long as wide; claspers thick, obtuse. In the following description all the measurements are in microns: middle antennal joints about 125 long, with short bristles (about 20 long) of about equal length; last joint 144, penultimate 110; first and second together about 120; third joint about 100, longer than fourth (as in *S. villosa*); halteres about 340 long, with a large elongate-oval knob, which is about 220 long and 93 broad; claws simple; hind legs with coxa about 355, femur about 830, tibia 930, tarsus 1000, of which 476 is basitarsus; first vein ending 270 before level of forking of fourth, and third ending about 440 beyond that level; width of fork of fourth in middle about 170. In Williston's table of St. Vincent species (Trans. Ent. Soc. Lond. 1896) this runs to *Sciara* sp.; the anterior furcation (of fourth vein) is about as in *S. debilis*, except that it is not at all contracted apically.

Among the species described by Felt (1897), the venation is essentially as in *S. agraria*, Felt, except that the anal curves downwards more abruptly at end. The genitalia are as in *S. agraria*, but more robust.

I cannot identify this with any of Meunier's species from amber. It is too large for *S. variabilis*, *verticillata*, *eocenica*, *diabolica*, *rara*, *bella*, *ignorata*, &c. The second antennal joint is much too broad for *S. botuli*, which is also a smaller species. The third joint is too short for *S. errans*, but agrees with that of *S. splendida*, which, however, has longer hair on antennæ. The terminal joints are nearly as in *S. villosa*, but the last joint is not quite so long as in that species. The joints are quite distinctly petiolate, as in *villosa*, but not so much so as in *S. eocenica*. The last joint is too long for *botuli*. Compared with *S. sendelina* the hair of antennæ is too short, and the apical joint differs in not being tapering.

Hab. Baltic (Prussian) amber; purchased from Mr. Janson. Trichomes of *Quercus* are in the same piece.

Macrocera abundare, Meunier. (Mycetophilidæ.)

In Baltic amber, purchased from Mr. Janson. Trichomes of *Quercus* are in the same piece. This is not a typical *Macrocera*; it should perhaps constitute a distinct genus.

Myiolepta lühei, n. sp. (Syrphidæ.)

Probable length about 11 mm., wing 9 mm., or a fraction less; legs rather robust, black, with dark hair; a dark cloud traverses the wing in the region of the forking of veins 2 and 3, and above and below (the same is seen, less developed, in the living *M. varipes*); venation agreeing with *M. varipes*, Lw., in nearly all respects. The following table brings out the venational characters:—

Second vein ending nearer to third than to first . . . *M. bella*, Williston.
Second vein ending much nearer to first than to third . . . 1.
1. First posterior cell ending almost on margin of wing; outer side of discal cell nearly straight; fourth vein more strongly bent near end of discal cell . . . *M. lühei*, n. sp.
First posterior cell ending some little distance from margin of wing; outer side of discal cell bent inwards; fourth vein less strongly bent near end of discal cell . . . . *M. varipes*, Lw.

Hab. Baltic (Prussian) amber; in the University Museum at Königsberg.

Boulder, Colorado, U.S.A.: Jan. 1910.

THE CULICIDÆ OF FIJI, INCLUDING TWO NEW SPECIES.

By F. V. Theobald, M.A.

Up to the present time only four species of mosquitoes have been recorded from the Fiji Islands, namely, *Stegomyia fasciata*, Fabricius; *S. scutellaris*, Walker; *Culex nocturnus*, Theobald, and *C. fatigans*, Wiedemann.

Mr. F. Jepson, the Government Entomologist, has recently sent me a small consignment which contains two new species, described here.

One of the commonest mosquitoes in Fiji is the Tiger Mosquito (*S. fasciata*). The specimens I have received from the islands are all rather small, but otherwise quite typical. Mr. Jepson writes that this species is supposed to convey dengue fever there. Dr. Bancroft, in Australia, also regards this insect as the transmitter of "dengue."

Culex fatigans, Wiedemann, is also very common, and is probably the species connected with Filariasis.

Culex nocturnus, Theobald (Mono. Culicidæ. iii., p. 159), was received from Dr. Hall and taken at Ba, where it was found active at night in houses. It can be told by the abdominal ornamentation, the ground colour deep brown, the base of the second, third, and fourth segments having white bands, the fifth and sixth with white basal median patches, constricted in the middle, the sixth and seventh with narrow apical yellow bands, laterally are median white spots, and the venter is ochreous. The legs have basal pale bands, which are narrow on the fore and mid pairs, broad on the hind, and the ungues of the two front pairs are uniserrate, whilst those of the hind are simple.

These characters will at once separate it from the new species of *Culex*, described here (*C. jepsoni*). The specimens sent were taken in April, May, and June.

With regard to *Stegomyia scutellaris*, Walker, I do not feel certain. Some much rubbed specimens sent me were taken to be that species, but I noticed at the time that there were three more or less parallel white scaled lines on the sides of the thorax. On comparing Mr. Jepson's specimens, I find they are distinct from the true *S. scutellaris* of Walker, and I have described them here as a new species.

The original record of *scutellaris* for these islands was made on some specimens sent to the British Museum by Mr. B. G. Corney (Mono. Culicidæ, iii., p. 144, 1903), who also sent the following note:—"Diurnal mosquito, disappearing entirely at night, taken in a wooden hut five yards from high water line of sea coast, on sandy soil, forest adjoining and high land; locality, Island of Bega."

Walker's species can easily be told by its having the sides with white puncta, not lines, and by the basally white banded abdomen and longer wings; otherwise, the general appearance is very similar.

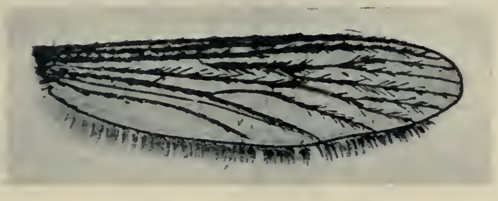
Culex fatigans, Wiedemann, is the common brown, unbanded-legged household mosquito, which seems to occur like *S. fasciata* all over the tropics and sub-tropics, and on most oceanic islands.

One specimen sent by Mr. Jepson near *Culex jepsoni*, nov. sp., was too damaged to describe, but is apparently distinct, having an ochraceous scaled venter to the abdomen.

Stegomyia pseudoscutellaris, n. sp.

Head black, with white median line and a white patch on each side. Thorax blackish brown, with brown scales, a narrow median white line, a thin white line on each side above pleura, extending lateral from the head to root of wings; pleura bright brown, with one long and one short parallel white lines, which are also parallel with the one above the pleura. Abdomen black, unbanded above, but with curved white spots ending about the middle of the segments; basal white bands ventrally. Legs black, with narrow basal white bands to the metatarsi and first tarsals on fore and mid pair; the hind with broad basal white bands and the last tarsal all white.

♀. Head black, clothed with flat black and white scales, the latter forming a broad median line and a patch on each side and small white scales around the eyes; chætæ black; the white median area passes well between the eyes. Proboscis and clypeus black; palpi black, the upper surface with snow-white scales for about half their length from the apex; clypeus black, with bronzy sheen and with a transverse carina ending each side in a slight swelling; antennæ black; basal segments black, with silvery white flat scales on the inner side; second segment slightly paler at the base.



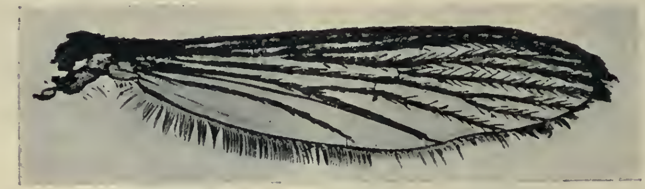
Wing of *Stegomyia pseudoscutellaris*, n. sp., ♀.

Thorax dark brown, with bronzy-brown narrow-curved scales, a narrow median white line extending from the fore border of the mesothorax to the bare space in front of the scutellum; a thin white line on each side between the mesonotum and the pleura composed of small flat scales, extending just past and over the base of the wings; pleura rich brown, with a long thin white line with a small one below it both running parallel to the white line above, composed of flat scales; scutellum brown, with flat white scales; metanotum deep brown. Abdomen deep black, the segments with curved white lateral areas which end in the mid or posterior third of each segment; posterior border-bristles dark; venter black, with prominent basal white bands; legs black, with white basal bands; femora pale at base and below with white apical spots, base of metatarsi and first tarsals of fore and mid legs with narrow basal white bands, other tarsals unbanded, in hind legs basal bands white and broad, the last tarsal all white; ungues all equal and simple.

Wings with rather short fork-cells, the first longer and narrower than the second, its base slightly nearer the base of the wing, its stem about half as long as the cell; stem of the second posterior nearly as long as the cell; posterior cross-vein a little longer than the mid, about twice its own length distant from it; scales brown, and rather dense. Length, 3 to 4 mm.

Hab. Suva, Fiji (F. Jepson).

Observations. Described from three females. This species may easily be mistaken for *S. scutellaris*, Walker, as its general thoracic ornamentation is very similar, but in *scutellaris* there are white-puncta on the pleura, in this two white lines, which together with the mesothoracic one, show as three parallel well-marked lines mentioned in the third volume (p. 144) of my 'Monograph of Culicidæ.' The abdominal ornamentation also differs and the wings are relatively much shorter, as shown in the figures given here.

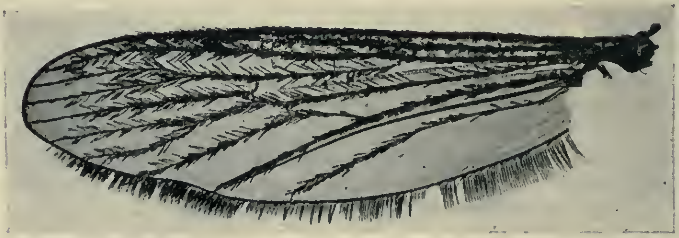


Wing of *Stegomyia scutellaris*, Walker, ♀.

Culex jepsoni, n. sp.

Head rich brown, a narrow pale border around the eyes, broadening out laterally. Proboscis black, with a distinct narrow median creamy-white band. Thorax brown, with darker lines and some patches of indistinct paler scales. Abdomen blackish, with basal white bands above and below, the latter broadest. Legs deep brown, with narrow apical and basal pale banding; ungues equal and simple.

♀. Head deep shiny black, with narrow-curved dusky and dull creamy scales, the latter especially forming a narrow border around the eyes which runs at the sides into a dull white scaled area, the whole area (except the flat white scaled lateral patches) with very numerous dusky upright forked scales; a row of long dark chætæ project forwards over the eyes. Proboscis jet black, with a narrow median creamy-white band; palpi black; the apex creamy-white and black chætæ; antennæ deep blackish-brown, base of second segment reddish-brown; clypeus black. Thorax deep brown, with a median and sub-median darker lines, clothed with narrow-curved brown and dull golden-brown scales and four indistinct paler scaled spots, almost golden in some lights; chætæ black, with golden reflections at their apices, especially dense and short and thick over the roots of the wings; around the bare space in front of the scutellum are pale scales which spread on to the dark scutellum; posterior border-bristles



Wing of *Culex jepsoni*, n. sp., ♀.

long, dark brown, golden reflections apically, eight to the mid lobe; metanotum black; pleuræ dusky, with patches of flat white scales and some golden chætæ, one prominent patch. Abdomen steely black, with dusky black scales and basal white scaled bands and basal white lateral spots, which run a little along the sides of the segments; border-bristles golden, short in the middle, long at the sides; basal segment all dark scaled with two patches of short dusky hairs, golden at their apices and longer ones at the sides of similar hue; venter black, with broad basal white bands.

Legs dark blackish-brown; the fore pair with a small pale spot at the apex of the femora and tibiæ, and a narrow pale band at the junction of the metatarsus and first tarsal; mid legs similar, but traces of banding at the junction of the first and second tarsals as well; hind legs with the narrow banding more pronounced; ungues all equal and simple.

Wings with the fork-cells rather short, the first sub-marginal longer and narrower than the second posterior, its base if anything slightly nearer the apex of the wing, its stem about half the length of the cell; stem of the second posterior also about half the length of the cell; posterior cross-vein longer than the mid, about two and a half times its own length distant from it. Scales brown, dense, median ones of short broad *Tæniorhynchus* type, lateral ones straight, narrow, but broader than in *Culex*. Length, 5 mm.

Hab. Suva, Fiji (F. Jepson).

Time of Capture, February 8th, 1910.

Observations. Described from a perfect female, caught by Mr. Jepson in his laboratory. A very distinct species, near to *Culex nocturnus*, Theobald, from the same island, but the ungues being simple, not uniserrate on the fore and mid legs as in that species, at once separate it. In the latter also the abdominal bands bend in the middle, and on some segments do not form actual bands. Nor has *jepsoni* the well-marked median lateral spots seen in *C. nocturnus*.

Another female shows the venter of the abdomen mostly pale scaled, and the pale lateral spots are much larger than in the type, and is probably a distinct species but too damaged to describe.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 136.)

Before considering the question of the male genitalia, with special reference to the group before us, it seems to me necessary to make certain observations and to venture certain opinions on the subject at large. There can, I think, be no doubt that the likenesses and differences between these structures are of great phylogenetic value, and are moreover in most cases an important auxiliary, and in some possibly the decisive factor, in the determination of species. But I cannot help thinking that extravagant claims have been made both as to their actual value, and perhaps even more as to their comparative value with regard to other structures, in differentiating species. Of course, if the differences were such as to debar insects from pairing, no claim based upon them for the differentiation of species could possibly be regarded as extravagant, for the circumstance would of necessity act automatically in keeping species apart; and I readily admit that there was a time when I was a full believer in this "lock and key" theory, as it has been called, and was under the impression that only the most closely connected species would ever pair in a wild state, and that the fact of insects of different species ever pairing (except in captivity) was in itself enough to show that they were at least congeneric. But this was in the days when *a priori* reasoning was in vogue, and when, moreover, I had access to few facts other than those which entered into my own very limited experience. It is now of course a matter of common knowledge that scarcely any pairing, even in a wild state, is out of the question, unless some obvious reason should render it physically impossible; and it would be a mere matter of searching in periodicals and the 'Zoological Record' if one wished to produce a long list of what would otherwise be astounding cases. Here are a few picked up at random in the course of searching for information on a widely different subject:—*Tæniocampa stabilis* ♂ and *T. gothica* ♀ (Ent. xxi. p. 158); *Cerastis vaccinii* ♂ and *Miselia oxyacanthæ* ♀ (*loc. cit.* p. 188); *Xylophasia monoglypha* ♂ and *Hadena trifolii* ♀ (*loc. cit.* p. 282); *Melitæa athalia* ♂ and *Polygonia c-album* ♀ (Schneider, 'Iris,' xix. p. 107); *Aglais urticæ* ♂ and *Epinephele janira* ♀ (Ent. xxxiii. p. 224); *Melitæa cynthia* ♂ and *Erebia lappona* ♀ (Rebel, 'Societas Entomologica,' ii. p. 73); *Attacus cecropia* ♂ and *Sphinx ligustri* ♀ (Ent. xix. p. 136); *Dryas paphia* ♂ and *Parnassius apollo* ♀ (this I saw myself at Faido, in the Leventina, in company with Mr. Warren); *Salamis anacardii* ♂ and *Aphelia apollinaris* ♀ (Trimen, Proc. Ent. Soc. Lond. 1880, pp. 23, 24, the moth being a day-flier, and bearing a general resemblance to the butterfly); *Euchloë cardamines* ♂ and *Bapta temerata* ♀ (Ent. xxi. p. 188—here there is no such excuse). I have arranged these in an ascending scale of significance, at least as the instances strike me, and it will be readily seen that they are not the result of search, by the very small number of publications mentioned. If I had the time, and the search seemed sufficiently profitable, I could certainly make the list several times as long, but quite enough has been said to support my assertion that the differences, even between the most widely separated insects of the order, are not such as to preclude pairing, and therefore cannot be treated as being of the same importance as if they were so. In reply to this argument it was remarked to me, by an enthusiastic supporter of the claims of this means of differentiation, that the important question was not that of mere pairing, but of *fertile* pairing. In answer to this there are two things to be considered. First, we do not *know* whether, or how far, these pairings are infertile. We do know that no insect has ever been taken which could possibly be a hybrid between *Euchloë cardamines* and *Bapta temerata*, for instance, or even between *Melitæa athalia* and *Polygonia c-album*, but, on the other hand, we know that hybridity interferes greatly with vitality, and even should some of the less violently abnormal pairings prove fertile, the chances of the progeny reaching maturity would be exceedingly small, and of those that reached the perfect state—if any did so—it is improbable that any would happen to be the specimens seen by lepidopterists, as they would probably be weak and fall an easy prey to marauders within the first few hours of their imaginal existence. But giving the fullest possible weight to this aspect of the argument, and granting that none of the above pairings (with the probable exception of the two Tæniocampids) could prove fertile, the very important fact still remains that it is not the differences of the structures in question which *per se* are the cause of the infertility, as they could only produce this effect directly by making pairing itself impossible, and that at the most they can only be a secondary and correlated cause, not to be compared in importance with such facts as species appearing at different times, inhabiting different altitudes or latitudes, feeding on different (or at any rate on unrelated) food-plants, hybernating at a different stage of existence, flying at a different time of day, or possessing any other habit which must either effectually keep them apart, or be practically certain to cause the early death of any hybrid progeny which might manage to struggle into existence.

These considerations appear to me to reduce the importance of these organs, which *prima facie* seem to be on such a vastly higher plane, to the same level as any other structural details, and as the differences are usually very slight, often actually and almost always relatively so, I should be inclined to assign to them, in general, an importance distinctly below neuration, still more markedly below that of the number of fully-developed legs, but possibly above that of scale-forms, even of the androconia, and probably above most other imaginal characteristics which have been used for purposes of classification, such as hairy or glabrous eyes, details of wing-shape and markings (including the presence or absence of "tails"—a very unimportant matter, I believe, especially when the "tail" is filamentous)—markings of the body, number of rings in the antennæ, &c.; on the other hand, I do not believe their phylogenetic and consequent classificatory importance to be nearly so great as that of many points in the earlier, especially the egg and newly-hatched larval, stages;

as these would seem, to some extent at any rate, to recapitulate the evolutionary history of species, genera, &c., or at least to point the way to a partial reconstruction of such history.

But putting all this aside, and granting for the sake of argument that this is the most important—nay, *far* the most important—of all structural differences, it is still liable to abuse; for it cannot for a moment be conceded (or even claimed) that this is the *only* mode of divergence, and parallel differences in this respect may have been evolved after other divergences had taken place, the dormant tendency having been retained, and we might thus find parallel groups exhibiting the same different forms of clasp, &c., even when these groups had in other respects diverged somewhat widely from each other; and, on the other hand, likenesses, or even identity of structure, in this respect might be retained, especially in closely related species, even after they were specifically separated by differences of habit, food-plant, habitat, &c. In the first case we should find two or more groups of insects, different members of which appeared, judging by the genitalia alone, to be more closely related to members of the other groups than to those of their own; and in the second case we should find insects, obviously from other reasons specifically distinct, "lumped" together as a single species, on the ground that they were not yet differentiated in this one particular. We have in fact no reason to suppose either that differentiation necessarily takes place simultaneously along various lines, or that it follows a certain routine order in the various lines along which it takes place; on the contrary, all such evidence as we at present possess would seem to point in an opposite direction. A further consideration tending towards the same conclusion is the fact that it is possible in this matter, as in others, that a similarity or even an identity of structure may sometimes be reached along different evolutionary lines. Just as I have wished to give the greatest possible weight to the arguments of those who have advanced the strongest claims as to the importance of these structures—a weight far greater than in point of fact I consider them capable of supporting—so here I feel my position to be so strong that I can afford to minimize the results that might fairly be made to rest upon the arguments that I have used, and to say only that it is manifestly unsafe to rest any part of a classification, whether generic or specific, upon the likeness or unlikeness, the difference or identity, of the genital armature *alone*. I should wish to forestall the possible objection, that nobody in point of fact does found any part of their classification on the testimony of these structures alone, by answering that though they generally appear to be unconscious of doing so in *theory*, yet some of the ablest exponents of the system certainly do so in *practice*, even if they call in other considerations afterwards in support of their results. If anyone should feel disposed to question this statement, the proofs are to be found in almost all writings on the subject; as an instance—let us hope an extreme instance—I would mention my friend Dr. Chapman's notice in the Ent. Record of the current year, p. 71, where the *Melitæas* that I brought from Reazzino, and believe to be *britomartis*, Assmann, are definitely pronounced to be *dictynna* on this character alone, and in total disregard of the many differences which I have already enumerated. To this, however, it will be necessary to recur.

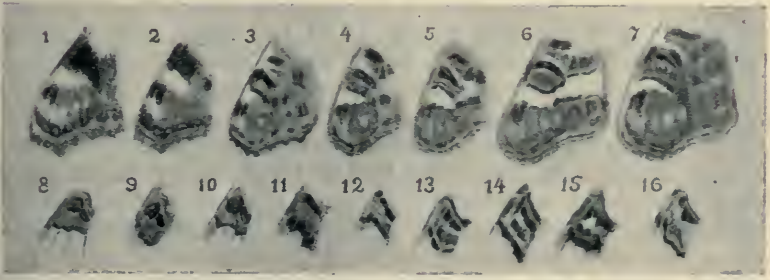
It seems also necessary to remark that this means of distinction, in common with all others, is of far greater value in some groups than in others. In a group, for instance, where there is close resemblance between the members with regard to the appendages, a slighter difference will be of importance than in a group where the divergences are generally considerable, and in the same way these characters are of much greater value for specific distinction where little or no variation occurs in the undoubted specimens of a single species, than in a case where their characteristics are by no means so constant.

(To be continued.)

VARIATION OF *A. LEVANA*, L.: COMPARATIVE DESCRIPTION AND POSSIBLE SIGNIFICANCE OF THE WING MARKINGS IN *LEVANA*.

By T. Reuss.

(Continued from p. 141.)



The above figures give a comparative view of some of the facial details in the different species to which I have referred. Fig. 1 is a form of *V. io* ab. *fischeri*, and discloses the normal *io-form* shape of the third (apical) costal blotch. A similar development of the marking is shown in the aberration of *V. urticæ*, fig. 2, which was bred by heat, and in *A. levana*, fig. 3. The latter is an apparently very primitively marked female specimen from the Ussuri regions in Eastern Siberia (for hind wing, see fig. 4 in the next row of figures), and not only exhibits the second costal blotch divided into three parts (counting the light median part, which is of the original ground colour), as in the fritillaries—(fig. 11 is drawn from *B. euphrosyne* ab.; see pl. 56, fig. 1, in Mr. South's 'Butterflies of the British Isles')—but also the black inner marginal spot is broken up into three parts. That the second costal blotches of *V. io* and *V. urticæ* originally consisted of three such parts, as are shown in the upper side of *A. levana*, is betrayed by the corresponding parts in the under sides of these species: fig. 8 (*V. io*), and figs. 9, 10 (*V. urticæ*). All other "tortoiseshell" forms of the Vanessidæ have similar under side markings. In the Pyrameid groups the same parts are responsible for the beautiful differently shaped metallic-blue markings in the *atalanta-form* species—*itea-gonerilla* (with conspicuous blue rings), *indica-tammeamea*, *dejeani-atalanta*. In these species the blue colour *demarcates the median part belonging to the second costal blotch*. In the Araschnids, and in the *cardui-form* Pyrameids, these demarcations show a yellowish or greyish colour, and are therefore comparatively inconspicuous. They are all, however, easy to compare when drawn in "black and white." Fig. 12 shows these markings in the under side of *P. carye*, fig. 13 is drawn from *P. myrinna*, fig. 16 from *P. cardui*, fig. 14 from *P. atalanta*, and fig. 15 from *P. indica*. The beautiful blue ring in *itea-gonerilla* arises in the same way as the nearly ring-shaped (yellow) demarcation in the second costal blotch of *A. bureyana*, fig. 6 (under side). The—especially characteristic—markings in the basal and apical parts in the fore wing under sides of *Hypanartia** (closely allied to *Pyrameis*) *delius* (from Sierra Leone), *H. schoneia* (Natal), correspond especially well with the markings in the same wing parts in *A. levana*. The figures 4, 5, 7 represent under side markings of *A. levana* and *A. bureyana* var. *thibetana* ♀ (fig. 7),† which latter is the "under side *io*" of the Araschnids (compare fig. 1); fig. 4 is taken from a female *levana* from Berlin, fig. 5 from a male *levana* from the Sayan Mountains (Irkutsk), which latter local form shows an increase in size. While exhibiting further variation of the median part in the second costal blotch, these specimens also show *how the shape of this costal marking is altered as a whole*—(1) when the apex becomes ocelliform (figs. 1, 7), or (2) when the wing is fasciated (fig. 6). Figs. 4 and 5 exhibit intermediate markings.

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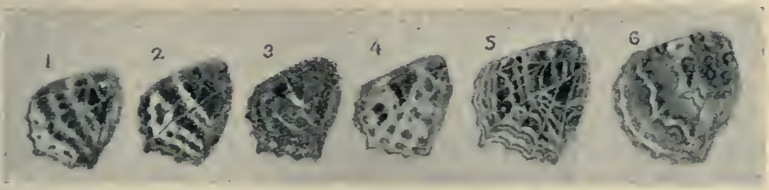
* The only *wholly African* species of *Pyrameis*—*P. abyssinica*—is interesting for resembling the African species of *Hypanartia* in its upper side.

† The facial differences between *bureyana* and var. *thibetana* are so great that one suspects them to be different species.



Of the six hind wings shown above, figs. 1, 2, 3 are drawn from the upper sides of *levana* aberrations. Fig. 1 was bred by low temperature (breeder unknown to me) in Köslin, on the Baltic. *The marginal band is atalanta-form*, the colours are exceptionally rich, the markings in the fore wings resemble those of *levana*, but the very dark brown under side is without the violet colour-splashes of *levana*. Fig. 2, ab. *porima*, from Eichstädt, north of Ingalstadt, on the Danube, almost exactly copies the markings of *A. bureyana*. As a whole, the specimen has just the appearance of a "cross" between *levana* and *prorsa*; all the markings and colours of the two varieties are combined in the facies. Fig. 3 dates from Augsburg-on-the-Lech, south of the Danube. *There are blue spots in the margin of the wing.* The vestiges of the fascia are creamy-white, the median lines marking the position of the *levana* spots are orange, the fore wings show markings like *prorsa*, but the colour of the central band is orange, though the costal blotch is creamy-white. The under side is that of *prorsa*. Fig. 4 shows a specimen of *A. levana* from the Ussuri regions, north of Vladivostok (the fore wing is shown in the preceding set of figures). The large isolated costal blotch (composed of three parts) reminds one of the markings in *V. io* and in aberrations of *V. urticæ*, of which latter I have bred several specimens in which the discal cell is orange-coloured. Similar markings are found in other "tortoiseshell" forms of Vanessidæ. The transversal row of black markings usually adjoining the costal blotch in *levana* is nearly obsolete in fig. 4, but the second row of spots is strongly developed, and when one remembers that some of these spots are often blue-centred in *levana*, the two spots in the outer angle cannot fail to suggest that the ocellus of *V. io* may have developed from similar markings. The under side of normal *V. io* exhibits details which support this inference in every way. In fig. 4 the third row of spots (lunules) is powdered with blue, but already the spots are shaped like the corresponding markings in the under side of *V. io*. In the hind wing of the aberration of *V. io* (figured in *antea*, vol. xlii. p. 223), the three (five) separate spots correspond in position with the median row of spots in *levana*, and need not, therefore, be referred to the third row of spots (the lunules of *urticæ*). This *V. io* ab. is moreover remarkable for possessing *a complete corresponding row of median spots in the under side,* *while in normal V. io only the large spots in the outer angle, two shown also in A. levana, fig. 4, are plainly marked in the under side.* The "tortoiseshell" Vanessids develop the whole chain of spots also—sometimes both in the upper and under side—but the spots are only rudimentary, their real centres being visible mostly only in *Grapta*-species. In the Pyrameids *two* of these spots—*in each wing part one*—are usually far advanced by development. The Araschnids develop these markings much as they are found in the *atalanta-form* Pyrameids. All the Araschnids mentioned hitherto were fasciated at least in their under sides, but fig. 8 shows the normal facies of *A. davidis* (male), in which the central fascia is masked, and it may be of interest to note the markings by which the process of masking up is accomplished.

Fig. 6 (drawn three-quarter size) represents an aberration of *P. atalanta* (reared on September 22nd, 1908), which shows one of the most characteristic Araschnid markings—*a light line bordering the median ocelli.* The Araschnid fascia is also traceable, and *its upper part can be seen to have wandered towards the base of the wing* ; *P. indica* and the *cardui*-form species (also species of *Hypanartia*) show transitory stages of this movement. If the under side hind wings of *V. io* and of the "tortoiseshell" Vanessids are compared, it will be found that also in these the Araschnid fascia is plainly traceable, and *that it occupies exactly the same position in every wing as shown in the aberration of P. atalanta, fig. 6.* In normal *P. atalanta* the fascia is found in the same position, but it is not so plainly marked by lighter colours as in fig. 6.

(To be continued.)

A NEW SPECIES OF *TRACHYPUS* FROM ERYTHRINA, RED SEA.

By P. Cameron.

Trachypus curvimaculatus, sp. n.

Black, shining, a transverse broad line on the top of the face, the sides obliquely narrowed below, the incision forming a curve, the central lower part rounded; the part below the antennæ, except for a longish triangular black spot below each antennæ, the spot continued below along the suture and ending in a rounded spot which is dilated outwardly; laterally the mark is continued to the middle of the eyes, the upper half being obliquely narrowed, and the mandibles broadly at the base, pale yellow. The following markings are bright orange yellow: a large transverse spot, broadly rounded above, the apex transverse in the middle, the sides (this part wider than the central) roundly obliquely narrowed, a curved line behind the ocelli reaching close to the eyes, an oblique line in the centre of the upper half of the outer orbits, obliquely narrowed below, the raised apical part of the pronotum, tegulæ, scutellums, a spot on the sides of the centre of the metanotum, rounded above, dilated outwardly and gradually narrowed, tubercles, a curved spot behind them, narrowed to a fine oblique point above, dilated in the centre at the base, a large semicircular spot on the middle of the apex of first abdominal segment, the second almost entirely, the yellow rounded at the base, the apex with a slight incision, the apical three-fourths of the fourth segment, its apex incised broadly, but not deeply in the centre, the fifth with a four lobate line, the fifth and sixth entirely, the apical half of the second segment, the base trilobate, the central lobe the larger, a mark, with the inner side roundly obliquely narrowed on the sides of the fourth and fifth segments and with a transverse line on the base between them, and a narrow oblique line on the sides of the apical legs of a brighter sulphur yellow colour, the hind coxæ broadly black at the base, the fore femora narrowly black at the base above, the middle at the base all round and the hind femora, black. Wings hyaline, the stigma and nervures black. Basal three joints of the antennæ sulphur yellow, the third black at the apex above, the fourth yellow, black above, the rest brown, black on top. ♀. Length 9 mm.

Erythria, Red Sea.

Front and vertex punctured, closely, finely obliquely striated at the ocelli, the striæ commencing at the outer ones. Face finely punctured. Mesonotum and scutellum shining, sparsely, distinctly pnnctured in rows. Metanotum in the centre at the base finely, closely transversely striated, ending in a depression with its apex acutely pointed. Upper third of mesopleuræ raised, smooth, bordered below by an oblique furrow, the rest closely coarsely punctured. Metapleuræ closely, obliquely striated, first abdominal segment semisessile, broadly rounded above, wider that it is long at the apex, a little longer than the second.

Allied to *T. nursei*, Bingham.

JOTTINGS ON THE BRITISH ICHNEUMONIDÆ IN THE NATIONAL COLLECTION.

By Claude Morley, F.Z.S., F.E.S.

While engaged in the rearrangement of the National Collection in the British Museum last winter, I noted various points bearing upon the British List that may be of interest in resolving some of the enigmas which always surround a partially studied group of insects. In my Preface to the first volume of 'Ichneumonologia Britannica,' I was careful to present that work in the form of a basis, not a termination, of investigation into the subject. Since then I have studiously refrained from publishing anything, unless of moment, respecting our Ichneumonidæ for fear of confusing the many acolytes who were beginning the study, since I had myself suffered from surfeit of scattered information. Only five papers having reference to the three published volumes of my book have appeared since 1903.* Perhaps, however, it were better to present the following notes at once, rather than store them up, *perdu*, till such problematical time as a supplementary volume might appear. As a whole the National Collection, though sufficiently full in the commoner kinds, is distinctly lacking in interest through the specimens emanating, for the very great majority, from Stephens's and Desvignes's collections, neither of which bore locality labels; Fred. Bond, many years ago, presented his collection, duly ticketed with biologic details, which were deplorably destroyed; there is a small amalgamated collection from Dr. Heysham of Carlisle, together with that of Rev. T. A. Marshall, and a good many odd and localised specimens from various sources; the latest addition is from Mr. C. G. Champion, who presented his small collection last January. As a whole, however, it had not been touched since 1856, and contributions are still badly needed, especially in the smaller species of Cryptinæ, which group, as will be seen, presented little of note.

ICHNEUMONINÆ.

Cœlichneumon.—There is no representative of *C. Bohemani*, and Stephens's mention of it must refer to something else. There are several *C. sugillatorius* from Heysham's, Desvignes's, and a female ex Stephens's collections.

Hoplismenus uniguttatus.—This has no doubt stood in our fauna on the strength of a single *Platylabus decipiens*, Wesm., which had long done duty for it, having been erroneously so named by Desvignes (Cat. 1856, p. 50). The former must be deleted.

Stenichneumon.—Several species of this genus are most unsatisfactorily established as British, but a pair of the four *S. castaneus* appear correct: at least, it is a species which I do not possess (till Mr. Champion kindly gave it me) myself, and which agrees very well with the descriptions of that insect;

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* (1) "On *Barichneumon heracleanæ*, Bridg., with a Description of the Male," E. M. M. 1904, p. 37. (2) "*Ichneumon inquinatorius*, Wesm. and *Amblyteles microcephalus*, Steph." *lib. cit.* p. 239. (3) "*Theronia atalantæ*, Poda, as British," Entom. 1909, p. 65. (4) Mr. Collins's "Note on the supposed Larva of *Pimpla oculatoria*, F., figured in Morley's British Ichneumons, vol. iii, 1908, and its Location." (5) "The Antipodean Genus *Proboloides*, Morl." *lib. cit.* p. 119. My paper "On the Ichneumonidæ of the Banksian Collection in the British Museum," Entom. 1909, pp. 131–137; and my "Observations on the Œconomy of the *Ichneumon manifestator*, Marsham (*nec* Linn.)." Journ. Linn. Soc. 1909, pp. 271–274, may also be consulted.

but the other two specimens belong to distinct species under the genus *Ichneumon*, *s.s.* *S. defraudator* is probably included on the strength of *I. sedulus* of Desv Cat., but all its exponents belong to *Barichneumon*. Of *S. apricus* there is no trace, though introduced by Stephens in his illustrations of 1835. There are nice series of both *S. culpator* and *S. pistorius*, which must be, or have been, much commoner elsewhere than is now the case in the east and south of England; a fine male of the latter, taken by Fred. Smith in N. Devon, is suggestive.

Ichneumon ruficeps, Steph. = *Melanichneumon sanguinator*, Rossi.

Ichneumon pallidatorius, Steph. = *Cratichneumon coruscator*, Linn., male.

Cœlichneumon albicillus, Grav.—There is a male *Cratichneumon fabricator*, F., ex coll. Steph., bearing a printed label "*Albicillus*, Grav.", which probably constituted the species brought forward by Stephens, and, as no one has found the Simon Pure since the latter's record, it should be regarded as doubtfully indigenous.

Ichneumon albimanus, Steph. vii. 133 = *Cratichneumon fabricator*, F., male.

This is not the place to go into the distinctions between *Cratichneumon nigritarius* and *C. albilarvatus*, which appear little more than colorational; if they be distinct, my details of capture, &c., in Ichn. Brit. i, must be referred to the latter and not the former.

Ichneumon Walkeri.—The single male in the collection is labelled "*Ich. Walkeri*" in Francis Walker's writing; this is not the type, but the supposititious alternate sex as described by me. The type is a female, of which Wesmael simply says (Bull. Ac. Brux. 1848, p. 184): "Specimen unicum ab oculatissimo entomologo Do Walker ex Londino accepi." I am glad to learn from Dr. H. Schonteden that the type is still extant in Wesmael's collection in the Musée Royale d'Histoire Naturelle de Belgique.

Ichneumon raptorius, Steph.—The author's "type" is a large female *I. gracilicòrnis*; and his *I. quadrinotatus* is, as I have pointed out, referable to the same species.

Ichneumon quadrialbatus.—The five males that were doing duty here are all referable to *Melanichneumon nudicoxa*, Thoms. (= *albosignatus*, Steph., *nec* Grav.).

Ichneumon maculiventris, Desv.—A re-examination of Desvignes's typical and unique female proves, without possibility of error, that it is synonymous with *Hepiopelmus leucostigmus*, Grav., var. *melanogaster*, and not (as ignorantly stated by me, E. M. M. 1902, p. 122 *et* Ichn. Brit. i. 170) with *Ctenichneumon cæruleator*, Zett, which must consequently be deleted.

Ctenichneumon plicatus, Morl. = *Spilichneumon occisorius*, Fab., var. *nigrinus*, Berth. Ann. Soc. Fr. 1895, p. 646. Professor

Brauns has called my attention to this fact by determining a male taken by the late Mr. C. J. Watkins of Painswick, Glos., under the latter name. The two forms look very different superficially, hence my error.

Acolobus.—There is no representative of this genus in the Collection; the specimens recorded under this name by Stephens consequently belong elsewhere: [*cf. I. albimanus*, supra].

Genus and Species doubtfully new to Britain.—I discovered a single specimen of *Ctenochares* (*Joppites*) *instructor*, Fab., female, among the "Reputed British Species" in Stephens's cabinet. Berthoumieu records it under the name *J. xanthomelas*, Brullé (Ann. Soc. Fr. 1894, p. 511), from Greece, Italy, Southern France, Spain, and Algeria; Dalla Torre says it also occurs throughout nearly the whole of Africa; and there is a capital figure of it by Guérin Menneville in Théophile Lefebre's "Voyage en Abyssinie," Paris, 1848, pl. vii, fig. 1, under the name *Ichneumon dimidiatum.* In the General Collection in Brit. Mus. are five other specimens thus:—Male from the Cape of Good Hope, ex coll. F. Smith; female from Sicilia, ex coll. F. Smith; two males from Spain, ex coll. Cameron; and a female "*Joppa apicalis*, Brullé: Zante (Greece), May, 1889: Dr. O. Schmiedeknecht," who, however, is certainly in error in placing it in the Listrodromini; I consider it should be placed in the Platyurini, near *Platylabus.* No suggestion of an indigenous origin has before been brought forward for this species, nor is such likely to be the case.

A New British Species.—Under *Ichneumon*, Desv. Cat. No. 46 (*pallidatorius*), I found a female *Platylabus* mixed: a black species with white-cinctured hind tibiæ, leaving no doubt respecting its identity with *P. histrio*, Wesm. (Bull. Ac. Brux. 1855, p. 412 = *P. variipedalis*, Wesm. *l. c.* 1857, p. 408). It is known to occur in Prussia, Bavaria, Belgium and Hungary, to which must now be added Britain, since I never have reason to doubt the native origin of Desvignes's insects, whence came this individual. I find I possess three others, taken by Mr. E. C. Bedwell at Boxhill on September 17, 1905, by Dr. Capron about Shere some twenty years ago, and by the late Mr. J. A. Clark, from whose collection I have but just acquired it.

Phæogenes stipator, Wesm.—The two males of *Ichneumon Cambrensis*, Desv., in his collection, are not the types of his species, as I had very naturally supposed to be the case (E. M. M. 1902, p. 123 *et* Ichn. Brit. i. 249). These are on gilt pins; but the types, also two males, were returned by Desvignes to Marshall, and are carded in the latter's collection, which I have merged with the other Britishers.

Notosemus (*Ischnidium*) *albibuccus*, Kriech.—This may now be definitely enrolled as British, since I find the specimen lightly mentioned by me (Ichn. Brit. i, Addenda, 293) to be in Marshall's collection, where it is labelled as captured by him at Bishops Teignton in Devon. It is probably the same as referred to by Thomson (Opusc. Ent. xv. 1627):—"Jag har endast sett en hanne af *N. albibucca* (Kriechb.), hvilken öfverensstämmer med ett exemplar från England utom deri att den sednare har bröstets undersida blek."

Ichneumon erythrocerus, Grav., may certainly be synonymous with *Oiorhinus pallidipalpis*, Wesm., as I indicated (*l. c.*) upon Marshall's authority; but his exponents are all *Phæogenes fulvitarsis*!

PHÆOGENES EQUES, Wesm.—The male, hitherto undescribed, may be characterised:—

Head normal and not strongly dilated posteriorily; face not strongly, but closely and distinctly, punctate; cheeks neither sinuate nor produced; frons closely, distinctly and somewhat deeply punctate; clypeus distinctly sinuate on either side; mandibles except apically, and the facial orbits very broadly stramineous. Antennæ nearly as long as body, fulvescent with the scape apically stramineous beneath. Thorax with the pronotum, small pre- and sub-radical lines, and the apical half of scutellum transversely stramineous; metathoracic areæ complete with the areola subcircular-hexagonal, but slightly longer than broad, and emitting costulæ before its centre. Abdomen badious with the distinct thyridii, and apices of the following segments paler; postpetiole subglabrous and laterally elevated, Legs fulvous with the anterior coxæ and trochanters entirely, and the hind ones apically, white; hind legs otherwise unicolorous infuscate ferrugineous. Wings normal with the tegulæ white, stigma fulvous and nervellus intercepted. Length, 6½ mm.

I brought the above species forward as British in 1903 on the strength of an indigenous female. The above diagnosis is drawn from a single male in the National Collection from that of Desvignes's, who had named it doubtfully as a variety of *Ichneumon albinotatus*, Grav. (*Barichneumon derogator*, Wesm. ?). Its association with the female is arbitrary.

Apæleticus bellicosus, Wesm.—The unique British female from Desvignes's collection is correctly named by Fred. Smith; and there is a male of *A. inclytus*, Wesm., from the same collection.

Ichneumon rufator, Steph.—I cannot yet place this male, which I again examined and confirmed as belonging to the Phæogenini.

Cœlichneumon impressor, Zett.—The malformed specimen with the right areolet wanting (referred to by Bridg.-Fitch, Entom. 1880, p. 297; *cf.* Ichn. Brit. i. 37) has nothing to do with this species, which is a misnomer. It is certainly a *Cratichneumon*, and can be nothing but an extraordinary freak of *C. coruscator*, Linn., male, though the metathorax is curiously convex.

Ichneumon memorator, Wesm., 1844.—The female which led Marshall to a knowledge of this species as British (*cf.* Ichn. Brit. i. Addenda 292) is in his collection, and was captured by him at Govilon, a village on the River Usk, near Abergavenny. It is entirely typical, except that the third segment is broadly black on the disc, and is new to Britain.

Platylabus volubilis, Grav.—There are three males in the Collection: one from Stephens's, one from Desvignes's, and one from the Linnean Society's collections. The last was named *Cryptus volubilis* by Gravenhorst himself, and there can be no doubt that it is correctly assigned to the genus *Platylabus*. The metathoracic spiracles, however, are distinctly elongate, and the red abdomen combined with large gastrocæli, punctate frons, elliptic spiracles, and pale marked anus, leave little doubt that it is synonymous with *P. orbitalis*, Grav. The differentiation of authors rests on the supposititious shape of the metathoracic spiracles, which were erroneously stated to be circular by Bridg.-Fitch. (Entom. 1881, p. 208). *P. volubilis* must, I think, sink as a mere synonym of *P. orbitalis*.

CRYPTINÆ.

Ichneumon canaliculatus, Desv. Cat. No. 22.—Three males standing under this name are certainly *Plectocryptus leucopsis*, Grav. *et* Morl. (Ichn. Brit. ii. 8): possibly Gravenhorst's earlier name should stand for this species, since the present males exhibit, though typically Cryptid, distinct carinæ on the second segment.

Cratocryptus (*Phygadeuon*) *tarsatus*, Bridg. Trans. Ent. Soc. 1881, p. 150 = *Plectocryptus pectoralis*, Thoms. Opusc. Ent. xxi. (1896), 2383, male and female, and should be relegated to the latter genus (*cf.* Ichn. Brit. ii. 17). It is very closely allied to *P. digitatus*, Gmel.; and the types of both sexes are in the National Collection.

Phygadeuon ambiguus.—The two male Cryptids thus named by Desvignes, upon the strength of which he brought forward this Gravenhorstian species as British, are *de facto* referable to nothing rarer than *Microcryptus abdominator*. I can at present say nothing more respecting Bignell's example (*cf.* Ichn. Brit. ii. 93); but, if retained, *P. ambiguus* must be regarded as extremely doubtfully indigenous.

Phygadeuon curvus, Steph. Illus. Man. vii. 299, is nothing but the male of his *P.* (*Acanthocryptus*) *4-spinus* (*l. c.* 298), and quite distinct from *Ichneumon curvus*, Schr.; a co-specific specimen in his collection bears the MS. name "*P. 4-dentatus*."

Hemiteles melanopygus, Grav.—No doubt can remain that Marshall's inclusion of this species in his 1872 Catalogue rests entirely on the single female Cryptid in the National Collection, from that of Desvignes; I have no previous knowledge of this species, but the example in question agrees admirably with the short description of authors (Ichn. Brit. ii. 170).

Pezomachus rotundiventris, Fst.—This female has, I believe, not been mentioned in literature since first described from a German specimen in the Wiegm. Archiv. 1850, p. 129; it has hitherto been unknown with us, and is certainly not in my own collection. One female was detected by Mr. Ernest A. Elliott among Rev. T. A. Marshall's insects, incorrectly named by the latter *P. pumilus*. The species is, comparatively, very distinct, and came from Deal.

Mesostenus transfuga.—This species (finally instated as British at E. M. M. 1907, p. 273) is represented by four females, none of which I had seen when writing my notes (*l. c.*). Two are from Marshall's collection, and were taken at Milford Haven about 1870; one is from the collection of Desvignes, who labelled it "*Phygadeuon nov. sp.*"; and the last was named for the Linnean Society by Gravenhorst himself, and may consequently be considered a subtype. With these was mixed a small female *Pyncocryptus peregrinator*, Linn., labelled "*transfuga*" by Stephens, showing it to be the type of that species in his collection. In Marshall's own collection I found a single pair, evidently taken at the same time and place as his two females above, and agreeing with them *ad amussim*, but labelled "*albinotatus*"! Here is the solution of the introduction of *M. albinotatus* as British: *M. transfuga* was mistaken for it by Marshall; and it must be omitted from our fauna.

Mesostenus maurus, Marsh. E. M. M. ix. p. 241.—Marshall did not examine the five females in the British Collection (from Dr. Heysham's, and taken, presumably, in the neighbourhood of Carlisle), but simply added a name to Fred. Smith's meagre description. It was the latter, doubtless, who erroneously referred them to *Mesostenus*, as I pointed out in 1903 (Ichn. Brit. i. 220), though the position I there tentatively assigned the species is also incorrect—since I had not then time to examine the hypopygium, which does not extend to the terebral base. Consequently, this species must be referred to *Hoplismenus* (which had already been done in MS. in the Collection by Buchecker), wherein it can be but the unknown female of *H. cornix*, Kriech., among the known species. The latter was bred in Austria by Dorfmeister from *Pararge mæra* (*cf.* Ann. Nat. Hofmus. Wien. 1890, p. 481 *et* Berth. Ann. Soc. Fr. 1894, p. 514, male). Unfortunately we know nothing of the origin of these Heysham specimens; but I possess a female myself from the collection of Alfred Beaumont, which he took at Courten, in Ireland, on September 1, 1893, and I have seen others or another in Bignell's, from South Devon. It is, of course, not an addition to our fauna, except in so far that its position has not previously been decided.

Relegating species to their correct location is no simple task in the Ichneumonidæ. *Microplites splendidulus* is treated as an Ichneumonid by Bridg.-Fitch; Stephens's figure of it looks like an *Atractodes* (Cryptid); Berthoumieu tells us it is a Tryphonid, and the two specimens standing under this name in Desvignes's collection certainly belong to the *Exochini*. *Mesoleptus Mulleri* (White) Butler, Voy. Erebus, 1874, p. 27, pl. vii, fig. 2, is a *Lissonota*, as I am enabled to say from an examination of the typical single male and female in the General Collection.

Pimplinæ.

Rhyssa leucographa.—The specimens in the British Collection from that of Desvignes, which I have mentioned (Ichn. Brit. iii. 29) as our only possible representatives of this species, have the clypeus produced and the central segments not apically emarginate; they are nothing but somewhat small *R. persuasoria*, and the former must, consequently, be expunged from our indigenous fauna.

Xorides albitarsus must also be deleted from the British List: the only representative being a female *Crypturus* (*Endurus*) *argiolus*, Grav., which is not yet recorded elsewhere as British, and probably crept in by accident, since it bears no resemblance to any *Xorides*, nor hint of its origin, beyond the simple number "23" (of lost meaning) on the pin. It is a native of Southern Europe, said by Giraud to attack *Polistes diadema*, and is very unlikely to extend so far north as Britain.

The above shows the species to be added and omitted to our indigenous fauna to be as follows:—

Delecti.

Platylabus histrio, Wesm.
Hoplismenus maurus, Marsh.
  =? *H. cornix*, Kriech.
Ichneumon memorator, Wesm.
[*Phæogenes eques*, Wesm., male.]
Notosemus albibuccus, Kriech.
Pezomachus rotundiventris, Fst.

Deleti.

Platylabus volubilis, Grav.
Hoplismenus uniguttatus, Grav.
Ctenichneumon cæruleator, Zett.
Ctenichneumon plicatus, Morl.
Mesostenus albinotatus, Grav.
Rhyssa leucographa, Grav.
Xorides albitarsus, Grav.

March 10th, 1910.

ON NEW SPECIES OF *BETHYLINÆ* FROM BORNEO.

By P. Cameron.

Epyris kuchingensis, sp. n.

Black; the flagellum, clypeus, mandibles, palpi, the tarsi, anterior tibiæ, the apex of the others and the tegulæ, rufo-testaceous; wings hyaline, tinged with fulvous at the base, the nervures rufo-testaceous.

Metanotum closely, somewhat strongly transversely striated; the central keel straight, the lateral with the basal half roundly dilated outwardly, the sides dilated at the apex into a blunt tooth, below which is a rounded incision. Metapleuræ, except at the top, closely longitudinally striated; the base and lower part of the mesopleuræ bordered by a keel, inside of which is a distinct furrow. ♀. Length 4 mm.

Shining; the head weakly but distinctly punctured, the punctures clearly separated. Ocelli in pits, forming a triangle; the pubescence is moderately thick. Pro- and mesothorax covered sparsely with pale pubescence. Parapsidal furrows curving towards each other at the apex. Scutellar foveæ deep, oblique, oval. The sides of the metanotum are bordered by a keel, inside of which is another, the two uniting at the base; the space between them, except at the base, is striated; there is a large depression at the base of these two keels.

Goniozus borneanus, sp. n.

Black; the antennæ yellowish-testaceous, the tibiæ and tarsi of a more reddish testaceous colour; the wings hyaline, clearer behind the stigma than beyond it, the nervures pale testaceous, the stigma and parastigma dark fuscous, the former pale at the base, the apical margin ciliated. ♀. Length 2 mm.

Kuching, Borneo (John Hewitt).

Scape thickened, narrowed at the base, as long as the following two joints united; the latter are longer than wide, thinner and longer than the others, which are wider than long, the last conical, longer than the preceding. Head distinctly longer than wide, bearing scattered shallow punctures above, the temples smooth and shining; the part below the antennæ is bluntly triangularly produced, that above them indistinctly keeled. Temples obliquely narrowed, the occiput transverse; the hinder ocelli are placed close to the edge of the latter, behind the eyes, from which they are separated by about the same distance as they are from each other. Pronotum wider than long, longer than the mesonotum. The top of the thorax is smooth, shining; the apex of the propleuræ finely striated; the mesopleuræ shagreened; the metapleuræ finely, distinctly, closely longitudinally punctured. Sternum thickly covered with white pubescence. Abdomen as long as the thorax, smooth and shining, sharply pointed at the apex; the basal three segments of almost equal length, longer than the fourth.

There are no keels on the centre of the metanotum; the sides of the apical slope are keeled; it has a straight, oblique slope; the top part of the metanotum is shorter than the mesonotum and scutellum united. The transverse discoidal nervure leaves the basal shortly above the middle of the latter, and is as long as the upper part of the latter. Eyes large, placed on the middle of the head. There are no parapsidal furrows; the scutellum large, wider than long, almost as long as the mesonotum.

Isobrachium kuchingense, sp. n.

Black; the basal three or four basal joints of the flagellum, tegulæ, and the legs, except the coxæ and the greater part of the femora, testaceous, the head, thorax and legs sparsely covered with fuscous pubescence; wings hyaline, iridescent, slightly but distinctly tinged with fuscous, the stigma and nervures black. ♂. Length 3·5 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head and pronotum covered with shallow, clearly separated punctures, the latter more sparsely and weakly than the former and having a distinct row of transverse punctures across the apex. Basal half of mesonotum smooth and shining, the apical irregularly, rather strongly aciculated; there are no parapsidal furrows. Scutellum smooth, its basal furrow wide, deep. Middle of metanotum irregularly transversely striated; there is in the centre a straight keel extending to the apex; there is a shorter one on either side of it, about three-fourths of its length; outside these, one which roundly converges towards the apex, and which reaches to the apical transverse keel; the outer part of the metanotum is irregular, striated to near the apex, which is entirely striated and with a stout keel down the middle. Propleuræ aciculated. On the lower basal half of the mesopleuræ is a curved furrow, its straight lower branch divided by keels; beyond this is a rounded, curved, crenulated furrow, extending from near the tegulæ to the lower part of the apex; beyond this, on the upper half, is a shorter, wider, deeper oblique furrow, without striæ. The mesopleuræ are weakly reticulated, the vertical striæ stronger than the longitudinal. The antennæ are stout, shortly densely pilose.

SOME NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 139.)

Chionæma subalba, sp. n.

♂. Head and thorax white, the latter with three reddish bands, the posterior one short; abdomen whitish, tinged with reddish before the white anal segment. Fore wings white with four reddish bands; the subbasal not extending to inner margin; the antemedial nearly straight, but slightly turned inwards on the costa; the postmedial outwardly curved below the cell; the submarginal curved and almost parallel with the outer margin. The costal tuft with a black spot at its outer edge, and two black spots below it, the outer one linear. Hind wings white suffused with pale reddish except on the costal area; a faint fuscous lunule at end of the cell. Fringes white. Under side white, the costa of fore wings streaked with reddish from the base to the sexual mark; the reddish bands show but faintly; the lunule at end of cell of the hind wings is more distinct than on the upper side.

♀. Similar but with three black spots; the bands are rather narrower, and the antemedial has a slight inward angle above the middle.

Expanse, ♂ 42 millim., ♀ 52 millim.

Collection number, 1788.

Two male specimens and one female from Rantaizan (7500 ft.), May, 1909.

Chionæma propinqua, sp. n.

♂. Head and thorax white, the latter spotted with reddish; abdomen whitish, mixed with reddish hairs on the anal segment. Fore wings white with three reddish bands, and a narrow border on outer margin; sexual mark of moderate size with three black spots below it; the first of the bands is broadly angled below the costa, the second is inwardly angled below the middle, and the third is outwardly angled above the middle. Hind wings reddish. Under side reddish, the fore wings with a whitish streak along the inner margin, and a blackish patch in the cell. Fringes of all the wings whitish, those of the hind wings tinged with yellow on both surfaces.

♀. Except that the postmedial band of the fore wings is rather wavy, this sex agrees with the male in colour and markings.

Expanse, ♂ 32 millim., ♀ 40 millim.

Collection number, 760.

A female specimen, May 15th, 1906, and a male, August 2nd, 1906; both from Kanshirei (1000 ft.).

Somewhat similar to *C. interrogationis*, Poujade, but easily recognized by the characters indicated.

Chionæma quadripartita, sp. n.

♂. Head and thorax white; collar, two bars across thorax, and tips of the patagia crimson; abdomen whitish. Fore wings white with three slightly oblique, almost parallel, crimson bands, the antemedial rather nearer the basal than to the postmedial; three black spots; outer margin bordered with crimson. Hind wings reddish, inclining to whitish towards the base; fringes yellow tinged. Under side reddish, inner margin of fore wings and fringes of all the wings whitish.

♀. Agrees with the male, except that there are only two black spots on the fore wings, and the inner edge of the antemedial band is marked with black.

Expanse, ♂ 34 millim., ♀ 40 millim.

Collection number, 759.

A female specimen, May 1st, 1907, and a male, August 21st, 1908; both from Kanshirei (1000 ft.).

This species is rather like *C. flavicincta*, Hampson, but the male sexual mark is different.

Chionæma pusilla, sp. n.

♂. Whitish, thinly scaled, with reddish markings. Fore wings have four transverse lines, the first not extending to the inner margin; a submarginal line represented by three spots; a narrow and interrupted marginal line; a spot in the cell and two spots at end of the cell; the sexual mark is well developed both above and below. Hind wings have a small dusky spot at end of the cell.

♀. In this sex the markings are paler.

Expanse, ♂ 18 millim., ♀ 22 millim.

Collection number, 758.

One male specimen, April 22nd, 1906, and a female, May 2nd, 1907; both from Kanshirei.

Very close to *C. effracta*, Walk., of which species *C. pusilla* may prove to be a small local form.

Ilema pulverea, sp. n.

♂. Head, thorax, and fore wings fuliginous, dusted with pale grey; hind wings and abdomen pale fuscous grey. Under side as above, but the fore wings are not dusted with grey.

Expanse, 40 millim.

Collection number, 1791.

One male specimen from Rantaizan (7500 ft.), May, 1909.

This species comes near to *I. moorei*, Leech, from Central and Western China.

Chrysorabdia taiwana, sp. n.

♂. Head and thorax pale yellowish buff, the latter with a large blue-black spot on the back; abdomen yellowish buff. Fore wings pale yellowish buff, the costa edged with blue-black, narrowly on basal two-thirds and rather broadly on apical third; a broad blue-black streak above the inner margin, the inner end pointed and upturned, but not extended to the base of the wing, the outer end rounded before the hind margin. Hind wings pale yellowish buff. Under side similar to the upper side, but the markings on fore wings are without blue tint.

♀. Differs from the male in the patagia being blue-black; the costa of the fore wings is broadly blue-black, and the streak above the inner margin is longer.

Expanse, ♂ 44 millim., ♀ 54 millim.

Collection number, 750.

One male specimen from Arizan (7300 ft.), August 20th, 1908, and a female from Rantaizan (7500 ft)., May 9th, 1909.

In colour and markings of the fore wings the female of this species is very like the same sex of *C. viridata*, Walk.

Campylotes maculosa, sp. n.

♀. Head and thorax black; abdomen black above, greyish banded with black beneath. Fore wings black, the veins bluish; a whitish streak on the inner margin from the base to beyond the middle, and two whitish streaks in the interspaces above; a short red streak from base under the costa, this is crossed by the black subbasal line; in the cell are two streaks divided transversely by an undulated black line; the inner portion of the upper of these streaks is red, and that of the lower marked with red, the outer portions of both are white, and there is an elongate white spot above; a postmedial curved series of four white spots and eight others (four dot-like) beyond. Hind wings white; veins, submarginal line, and margins black; the upper part of the cell and the outer extremity of the lower part, also the internervular spaces within the submarginal line, from vein two to costa, red. Under side similar to the upper.

Expanse, 49 millim.

Collection number, 1214.

One female specimen from Suizan (8000 ft.), August 8th, 1908.

Heterusia formosana, sp. n.

♂. Fore wings dark green, with three large creamy-white spots (two in the cell and one below), and an irregular series of nine similar coloured marks before the outer margin; the latter marks are small in size, two, three, and eight are linear, the others round. Hind wings pale yellowish, black at extreme base; outer border blue, broad on costa, tapered towards anal angle, enclosing three creamy-white spots (the largest at end of the cell), and an irregular series of black marks. Under side of the fore wings blackish; the central area suffused with bluish; outer area of hind wings blackish suffused with bluish; markings are similar to above, except that those on the outer area are larger.

♀. Agrees with the male, but it has a creamy-white patch at the base of the fore wings, and there is less blue and more black on outer area of the hind wings.

Expanse, ♂ 58 millim., ♀ 66 millim.

Collection number, 658.

One male specimen from Suisha (Lake Candidius (2000 ft.)), October 1st, 1907, and a female taken July 26th, 1908, in the same locality.

The close similarity of the female of *H. formosana* to that of *tricolor* suggests that the former may possibly be a local form of the latter.

Ourapteryx taiwana, sp. n.

♂. Head white, face and palpi brownish; thorax white; abdomen greyish brown. Fore wings white, apical third blackish; ante- and postmedial bands oblique, blackish, slightly approximating on the inner margin; the inner edge of the blackish apical third parallel with the postmedial band; blackish streaks on costal area between the bands and towards the base; fringes dark brownish on outer margin, white on the inner margin. Hind wings white shaded with blackish grey on outer area; a black ringed golden-brown spot on the outer margin above the tail, and two blackish spots below the tail; fringes golden-brown, preceded by a black wavy line. Under side similar to above, but the shading on the hind wings is darker and the marks on the outer margin near the tail are absent.

Expanse, 62 millim.

Collection number, 1666.

One male specimen from Arizan, September, 1908 (7300 ft.).

ON A NEW GENUS AND SPECIES OF PARASITIC CYNIPIDÆ (EUCOILINÆ) FROM CAPE COLONY.

By P. Cameron.

Stirencœla, gen. nov.

♂. Antennæ fifteen-jointed, the third joint as thick and slightly shorter than the fourth, not incised; the other joints a little longer and thinner than the third or fourth. Scutellum prominent, roundly gradually raised from the base; the cup small, broadly ovate, placed on the apical slope above, the lower margin projecting as a rim. Post-scutellum large, projecting roundly above, obliquely sloped inwardly from near the top to the bottom; the post-scutellum is below the scutellum; both project over the metanotum. Mesopleuræ margined below; the apex of the metapleuræ broadly margined, the top roundly projecting. Base of pronotum stoutly margined round the top. Radial cellule closed on basal margin, the rest open; completely separated from costal cellule; the areolet obsolete, as is also the cubitus; an oblique nervure runs into the costal close to its base and another near its apex, the latter being bullated and longer than the space between it and the areolet; the margins are not ciliated, the wings being quite bare; the apex broadly rounded. Base of abdomen with a broad hair girdle. Malar space distinct, half the length of the eyes.

The ocelli are prominent and are placed on the margin of the vertex. Parapsidal furrows obsolete. The first abscissa of the radius is rounded and is distinctly shorter than the second, the costal nervure is bullated at its apex. Scutellar foveæ large, deep, divided by a distinct keel; the lateral partition is transparent in the middle.

Comes nearest to *Diranchis*, Foer., which may be known from it by the antennæ in the male having the first joint of the flagellum one and a half times longer than the second, the scutellum rugose not smooth and shining, and the wings pilose with a long ciliated border.

Stirencœla striaticollis, sp. n.

Black, shining, the flagellum of antennæ, legs and abdomen bright red; smooth, except the basal half of the pronotum which is distinctly, closely obliquely striated, wings brownish black to the radius and areolet, clear hyaline beyond; the nervures black; the cubitus very faint, almost obsolete. ♂. Length 4 mm. Antennæ bare, tapering towards the apex, longer by about one-third than the body. The hair on the metathorax sparse, long and white; the hair girdle of a darker white colour, tinged slightly with fulvous. The mandibles are dark rufous.

NOTES AND OBSERVATIONS.

Emergence of the Second Generation of Eustroma (Cidaria) silaceata.—In my note upon this matter (*antea*, p. 32) I find that I omitted to enter a male specimen that emerged on December 15th,

1909. This addition extends the period of emergence of the second generation to some twenty-three weeks. With regard to imagines resulting from the October pupæ mentioned in the note referred to, I may state that a male emerged on January 3rd last, another example of the same sex on March 4th, and finally a male on 27th of that month. I might add that I am again rearing the species from a fresh batch of Huntingdonshire ova. Larvæ from these commenced to hatch out on May 18th.—Richard South.

Gynandrous Saturnia pavonia (carpini).—On April 26th a gynandrous *S. pavonia* emerged from a Denbighshire cocoon which had lain over two winters. The right half of the moth (antenna, thorax, and wings) male, the left half female. The rest of the insect also appears to be a compromise between the sexes. Another curiosity is a cocoon from last year's larvæ which is entirely round, and without vent for the emergence of the perfect insect.—J. Arkle; Chester.

Errata.—P. 136, l. 19, for "almost black. Markings" read "almost black, markings." P. 139, line 9, for "basal two outer" read "basal and outer."

SOCIETIES.

Entomological Society of London.—*Wednesday, April 6th*, 1910.—Mr. H. Rowland-Brown, M.A., Vice-President, in the chair.—Mr. Horace B. Browne, M.A., of 118, Sunny Bank, Hull; Mr. William George Dawson, of 31, King's Gardens, West End Lane, West Hampstead, N.W.; Mr. Alfred Nander Hedges, of 42, Kensington Park Gardens, W.; the Rev. Hubert George Stanley, of Marshfield Vicarage, Cardiff; and Mr. Rupert Stenton, of Southwell, Notts, were elected Fellows of the Society.—Mr. W. G. Sheldon exhibited several series of the butterflies taken by him last July in the Hohe Tatra region of the Carpathians, Eastern Hungary. They included examples of *Melitæa dictynnoides*, Hormuzaki, with *M. aurelia* and *M. dictynna* for comparison; *Brenthis pales* var. *arsilache* from the forest zone at 3000 ft., and a form of *B. pales* from 5000 ft., with the upper side approaching in colour and markings to var. *arsilache*, but of smaller size, the under side being typical; also Swiss examples for comparison; *Parnassius apollo* var. *carpaticus*, Aigner, *Erebia medusa* var. *hippomedusa*, *E. ligea*, and *Cænonympha hero*.—The Rev. G. Wheeler expressed a decided opinion that *M. dictynnoides* constitutes a good species, and is not a form of *M. aurelia*.—Mr. P. Harwood brought for exhibition an example of *Strangalia revestita*, taken on a flower-head near Andover in 1909.—Mr. W. F. H. Rosenberg exhibited (*a*) a "combination" consisting of a Nymphaline butterfly, *Euphædra ruspina*, and three species of moths belonging to as many different families, viz. *Phægorista similis* (Hypsidæ), *Xanthospilopteryx poggei* (Agaristilæ), and a Geometer, *Aletis helcita*. These insects bear a close superficial resemblance to each other in colour and pattern of markings, the wings being tawny orange, with black marginal borders and white apical and marginal spots; (*b*) a pair of the Nymphaline butterfly, *Harma theodota*, a strikingly dimorphic species, the female of which bears some resemblance, especially on the upper side of the hind wings, to a moth, *Myctemera hesperia*, of the family Lymantriadæ; and (c) five species of *Planema* (family Acræida) and an equal number of species of *Pseudacrea* (family Nymphalidæ) mimicking them, the superficial resemblance being very close in each case. Special attention was called to the specimens of *Planema plagioscia*, the males of which, with tawny bands on the fore wings, are mimicked by the males of *Pseudacrea hobleyi*, whilst the females of the *Planema* with white bands are mimicked by the females of the same species of *Pseudacrea*. A discussion followed, in which Mr. J. W. Tutt, Mr. G. A. K. Marshall, and other Fellows joined.—Mr. H. St. J. Donisthorpe exhibited examples of *Methoca ichneumonides*, parasitic on the larva of the tiger-beetle, taken by him in the Isle of Wight. He said that it was apparently unknown in this country that *Methoca ichneumonides* is parasitic on this larva. But he had taken it at Blackgang Chine, where it would be parasitic on *C. germanica*. With these examples he also showed the hosts, *C. campestris*, *C. sylvatica*, *C. germanica*, and a tiger-beetle larva. Mr. Donisthorpe also exhibited an example of *Ptinella britannica*, Mat., found in a mole's nest at Burwell Fen last month. This is only the third British specimen that has yet been recorded, and apparently the fourth only in Europe, one having been reported from France.—Mr. Norman H. Joy, M.R.C.S., read a paper "On the Behaviour of Coleoptera during Floods," and exhibited living specimens to illustrate the remarkable power of *Dianous cœrulescens* in "skimming" on the surface of water. The following papers were also read:—"A Revision of the genus *Diplatys*, Serv.," by Malcolm Burr, D.Sc., F.L.S., F.Z.S., &c; "On the Geometridæ of the Argentine Republic," by Louis B. Prout—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April* 14*th*, 1910.—Mr. A. Sich, F.E.S., Vice-President, in the chair.—Mr. Ashdown exhibited a large number of Coleoptera taken in Switzerland during July, 1909, including *Staphylinus fossor*, *Tricodes alvœarius*, *T. apiarius*, *Spondylis buprestoides*, *Endomychus coccineus*, *Molorchus minor*, *Strangalia attenuata*, &c.—Mr. R. Adkin, long series of the various forms of *Hepialus humuli*, including some very fine Shetland specimens. — Mr. Cowham, portions of ash-stems showing extensive marks of the depredations of a species of *Scolytus* beetle.—Mr. Dennis, a long series of photographs of British lichens. —Mr. Turner, a number of species of Lepidoptera sent him from Saskatchewan and Vancouver by Mr. Croker, and commented on their British-like appearance; included were *Argynnis bremneri*, *Polygonia marsyas*, *Cœnonympha elko*, *Notolophus badia*, *Malacosoma pluvialis*, *Thanaos persius*, &c.—Mr. Newman, larvæ of *Dryas paphia*, *Melitæa cinxia*, *M. athalia*, *Argynnis adippe*, *A. aglaia*, and *Agriades corydon*, which he had been forcing. *Argynnis adippe* and *A. aglaia* had scarcely responded to the treatment, but the rest were practically all full fed.—Mr. Coote, a bred series of *Nyssia hispidaria* from ova laid in 1909. — Mr. Sich, the two species of *Adela* with entire yellow fasciæ—*Adela crœsella* (*sulzella*) and *A. degeerella*—and pointed out their differences.

April 28*th.*—Mr. A. Sich, F.E.S., Vice-President, in the chair.—Mr. W. West (Greenwich) exhibited numerous rare and interesting specimens taken mainly by himself forty or fifty years ago. Many were of local interest to entomologists of S.E. London. Included were *Pieris daplidice* (Folkestone), *Agrius convolvuli* (Greenwich Park), *Hippotion celerio* (Greenwich), *Deiopeia pulchella* (St. Margaret's Bay), *Spilosoma urticæ* (Greenwich), *Æ. cynipiformis* and *Æ. myopæformis* (Greenwich), *Æ. culiciformis* (Darenth), *Æ. ichneumoniformis* (Lee), *Colias hyale*, *C. edusa*, and var. *helice* from the Brockley railway-banks. — Mr. R. Adkin exhibited specimens of *Anthrocera*, including the form supposed to be a hybrid between *A. achilleæ* and *A. filipendulæ*, and stated that an examination of the genitalia by Mr. Pierce had shown that the example in question was the latter species. — Mr. Turner, a large number of Diptera, Ichneumonidæ, and other Hymenoptera, sent to him from Waroona, West Australia. — Mr. Sperring, specimens of *Amphydasis strataria* bred from ova, all having extremely dark bands. — Mr. Sich read a paper entitled "The Legs of Lepidopterous Larvæ."—Hy. J. Turner, *Hon. Report. Sec.*

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Vol. ix. By Sir George F. Hampson, Bart. Pp. i-xv, 1–552. London. Printed by Order of the Trustees. 1910.

The present volume concludes the Acronyctinæ, subfamily of the Noctuidæ. Including those in the Addenda, 727 species are here catalogued and described, and these are distributed among some 187 genera, of which sixty are new. The British species included are the following:—

Gortyna, Treit. (1825), t. *leucostigma*, Hübn. (also type of *Helotropha*, Led., 1857). *Apamea*, Ochs. (1816), t. *nictitans*, L. *Xanthœcia*, Hampson (1910), t. *flavago*, Schiff. *Hydrœcia*, Dup. (1844), t. *micacea*, Esp. *Pyrrhia*, Hübn. (1827), t. *purpurina*, Esp., includes *umbra*, Hufn. *Ipimorpha*, Hübn. (1827), t. *retusa*, L., in which is sunk *Plastenis*, Boisd. (1840), t. *subtusa*, Schiff. *Meristis*, Hübn. (1827), t. *trigrammica*, Hufn., also the type of *Grammesia*, Steph. (1829). *Calymnia*, Hübn. (1827), t. *trapezina*, L., also of *Euperia*, Guen. (1839); the other British species in the genus are *diffinis*, L. (t. of *Eustegnia*, Hübn. (1827)), *pyralina*, Schiff., and *affinis*, L. *Dicycla*, Guen. (1852), t. *oo*, L. (also type of *Eugramma*, Steph. (1850)). *Enargia*, Hübn. (1827), t. *paleacea*, Esp. (also type of *Euperia*, Guen. (1841)). *Phragmatiphila*, Hamps. (1910), t. *typhæ*, Thnb. (also type of *Nonagria*, Hübn. (1827)). *Arenostola*, Hamps. (1910), t. *phragmitidis*, Hübn.; the other British species included in this genus are *lutosa*, Hübn., *brevilinea*, Fenn., *elymi*, Treit., *fluxa*, Hübn., = *hellmanni*, Ev., *pygmina*, Haw., = *fulva*, Hübn., *bondii*, Knaggs, = *morrisii*, Tutt, and *extrema*, Hübn., = *concolor*, Guen. *Archanara*, Walk. (1866), t. *Nonagria polita*, Walk. (E. Asia); the British species referred to this genus are *geminipuncta*, Haw., *dissoluta*, Treit., = *neurica*, Hübn., figs. 659–661, *neurica*, Hübn., fig.381, = *edelsteni*, Tutt, *sparganii*, Esp., *algæ*, Esp., = *cannæ*, Ochs.

Cœnobia, Steph. (1856), t. *rufa*, Haw. *Nonagria*, Ochs. (1816), t. *maritima*, Tausch (also type of *Chilodes*, H.-S. (1845)). *Oria*, Hübn. (1827), t. *musculosa*, Hübn. (also type of *Synia*, Dup. (1844), and of *Tapinostola*, Led. (1857)). *Panemeria*, Hübn. (1827), t. *tenebrata*, Scop. (also type of *Heliaca*, H.-S. (1852)).

The South London Entomological and Natural History Society, 1909–1910. With Thirteen Plates. Pp. i–xvi, 1–133. The Society, Hibernia Chambers, London Bridge.

Considered either from the literary or from the pictorial point of view, the present volume of 'Proceedings' must be acknowledged as one of the best, if not *the* best, this eminently progressive Society has produced. In addition to the instructive matter detailed in the "Abstract," there are nine papers (of which we can only enumerate the titles) of considerable interest:—"Stray Notes on the Variation and Distribution of *Boarmia repandata* in Britain" (pp. 1–4, plate i.), and "Notes on the Earlier Stages of *Nola albulalis*" (pp. 41–42, plates xi., xii.), by Robert Adkin, F.E.S.; "Resting Attitudes of Lepidoptera," by A. E. Tonge, F.E.S. (pp. 5–8, plates ii. iii.); "Notes on Diptera," by H. W. Andrews, F.E.S. (pp. 34–40); "Larval Stages of *Chrysopora hermannella*, Fab.," by Alfred Sich, F.E.S. (pp. 43–49, plate xiii.); "Stray Notes on Ticks," by F. Noad Clark (pp. 29–33, plates ix., x.); "The Scotch Fir (*Pinus sylvestris*)," by W. J. Lucas, B.A., F.E.S. (pp. 9–13, plates iv., v.); "Fruits," by Hugh Main, B.Sc., F.E.S. (pp. 14–20, plates vi.–viii.); "Our Authorities: an Introduction to the Early Literature of Entomology," by Henry J. Turner, F.E.S. (pp. 21–28).

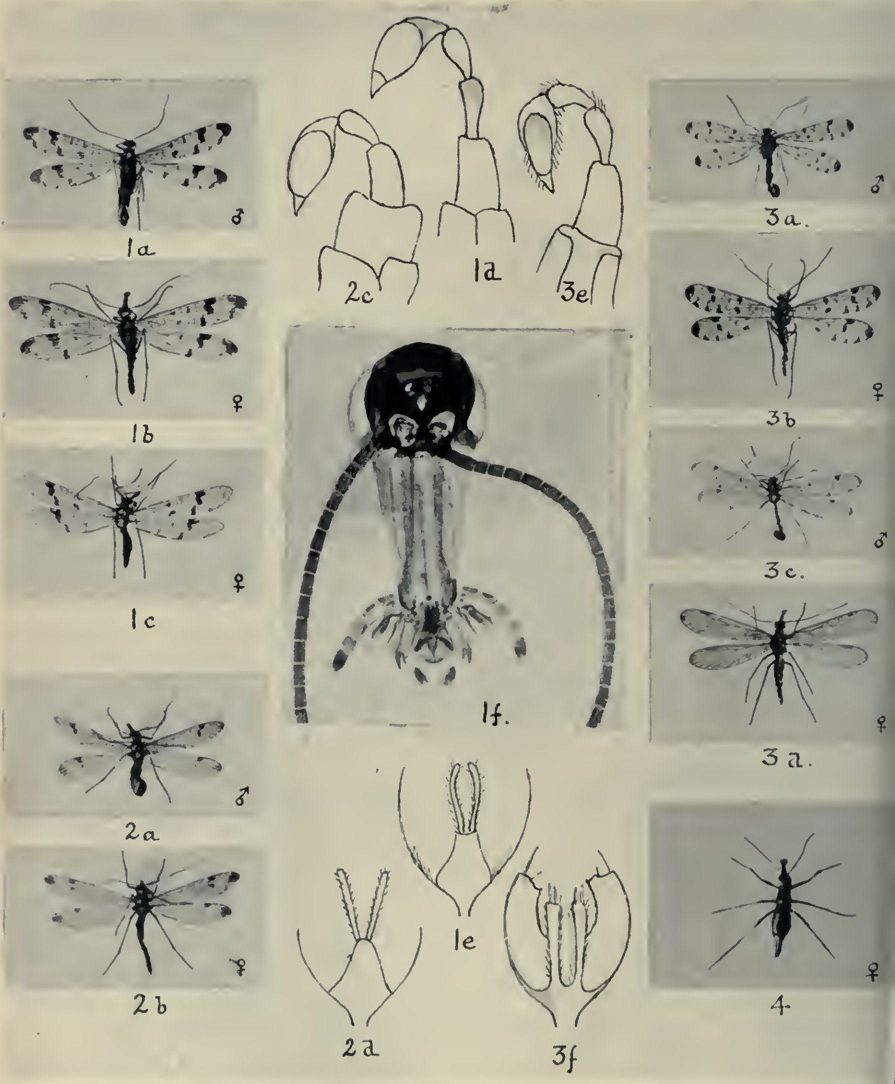
All the plates (except xiii., which is from drawings) are from photographs by the authors of the respective papers they illustrate, and are of great merit.

The President (Mr. A. Sich) devotes a large portion of his address to the interesting subject "Lepidopterous Evolution."

Catalogue of British Hymenoptera of the Family Chalcididæ. By Claude Morley, F.Z.S., F.E.S. Published by the Trustees of the British Museum. 1910.

Mr. Morley has published the first complete synonymic Catalogue of the British species of this well-known though little-worked family of Hymenoptera, uniformly with the defunct 'General Catalogue of the Insects of the British Isles,' begun by the Entomological Society. In the preface he tells us that this Catalogue completes our lists of the indigenous Hymenoptera, a vast order of insects, which numbers some 4830 species in Britain alone. Of these, the present list includes references to a hundred and forty-eight genera, comprising 1424 species, as is indicated in the summary, corrected to March 15, 1910. The whole is comprised in seventy-four pages, with index to the correct and the synonymic genera. A catalogue is the precursor of a monograph; with this basis we trust some student will ere long arise and give us a detailed account of these multitudinous and beautiful parasites.

The Entomologist, July, 1910. Plate IV



W. J. Lucas photo. aut del. West, Newman proc

BRITISH SCORPION-FLIES.

THE ENTOMOLOGIST

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BRITISH SCORPION-FLIES.

BY W. J. LUCAS, B.A., F.E.S.

(PLATE IV.)

WITHIN the natural order Neuroptera is to be found a distinct little group of insects, the typical members of which are most appropriately named "Scorpion-flies." McLachlan, in his monograph of the British Planipennia* (Trans. Ent. Soc. Lond. 1868), designates them Panorpina, thus giving them more than family rank, while some systematists go the length of constituting them a distinct order under the name of Mecaptera; but this seems scarcely necessary for ordinary purposes. In Britain we have, so far as is known, but four representatives of the group—three belonging to the typical genus, *Panorpa*, the scorpion-flies proper, and one species representing the peculiar genus *Boreus*.

Carnivorous habits characterise both of the active stages of these insects. The larvæ somewhat resemble those of sawflies, since they possess prolegs as well as true ones. Besides the scorpion-like tip to the abdomen of the male, perhaps the most distinctive feature of the imago is the beak-shaped head (Plate IV. fig. 1*f*), which is turned downwards when in its normal position. At its distal extremity are the mandibles and maxillæ, while the eyes and long antennæ are at its base. The wings are long, and in shape not unlike those of many dragonflies. It seems clear that the eggs are laid in moist soil, and that they hatch in about seven days. After feeding for about four weeks they become quiescent, but it is only after a further period of some weeks that they change into pupæ, which are motionless, although their limbs are free.

For much of what is known concerning the life-history of the scorpion-flies we are indebted to Brauer's two papers in Sitz. Akad. Wissensch. of Vienna, 1851, and in Verh. zool.-bot. Gesell. of Vienna, 1863. McLachlan has given a translation of part of the latter paper in the monograph referred to above. Another paper on the scorpion-flies of very general interest is one by E. P. Felt, D.Sc. (Report of New York State Entomologist, 1894, x. 96), in which he gives a full account of the habits and life-history of a North American species, *Panorpa rufescens.*

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* = Neuroptera (Entom. xlii. p. 271).

Though these writers are able to tell us something about the curious insects under consideration, still we know really very little about them, and entomologists who observe any points in connection with their economy should record them whether they study the Neuroptera or not. It seems clear that the larvæ are carnivorous, and as they are subterraneous they probably live on larvæ, worms, and so on. Whether they are predaceous, in the true sense of the word, we would like to know. It is perhaps established that in the imago stage they suck the juices of dead or injured animals, but do not hunt them down themselves.

Prof. E. B. Poulton, in his paper "Predaceous Insects and their Prey" (Trans. Ent. Soc. Lond. 1906), gives five instances of scorpion-flies with their prey: *P. meridionalis* surrounding and sucking a dead worm; *P. communis* with a Telephorid beetle; and three cases of *P. germanica*,* one with an Empid fly, and two each with a Bibionid fly. The *P. meridionalis* were clearly feeding on dead prey; as regards the others no inference may be drawn. Only once have I myself come across a scorpion-fly with its prey. On June 14th, 1908, near Oxshott, Surrey, one had possession of what appeared to be a whitish grub, which it seemed to be sucking. On my attempting to make a capture both dropped and could not be found. These insects always seem sensitive of one's approach, and often drop in this way. If followed, they usually dive into the matted herbage on the soil.

When handled, scorpion-flies eject a dark brown fluid and emit a somewhat offensive smell, the former perhaps being the cause of the latter. As further weapons of offence they possess the scopion-like forceps at the extremity of the abdomen, with which they are able to give a very effective nip.

As regards distribution, we again have very incomplete evidence, though probably *P. germanica* and *P. communis* are universal and common, while *P. cognata* is equally scarce. My own casual records, with dates, follow:—

P. COMMUNIS.—May 2nd, 1903, one male, Hurst Hill, New Forest; May 27th, 1903, a specimen with markings reduced, Horsley, Surrey; June 1st, 1901, Byfleet Canal, Surrey; June 7th, 1903, June 5th and 12th, 1910, Oxshott district, Surrey; June 6th, 1903, Horsley; June 19th, 1909, between Ashtead and

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* Fig. 3 *d* in the Plate accompanying this note represents one of these, its prey being *Empis tessellata.*

Burford Bridge, Surrey; June 20th, 1896, a fair number at Byfleet Canal, common on June 24th, 1903; June 24th, 1908, near Hindhead, Surrey; July 9th, 1904, a female near Ashtead; July 25th, 1903, one only, Byfleet Canal; August 8th, 1906, New Forest; August 27th, 1903, a male with rather suffused appearance to wings, New Forest; a female, August, 1907, High Cliff, Hants (from A. L. Simmons); a large bright female, September 3rd, 1907, New Forest.

P. GERMANICA.—One female, May 10th, 1905, between Claygate and Black Pond, Surrey; one male, May 12th, 1906, between Horsley and Clandon; two males, May 15th, 1897, near Claygate, Surrey; a female, May 16th, 1897, and a male, May 19th, 1902, Esher Common, Surrey; a pair, May 17th, 1902, near Effingham Station, Surrey; a male, May 18th, 1910, near Oxshott; a male, May 18th, 1907, New Forest; rather common near Oxshott, May 20th, 1910; May 22nd, 1897, near Horsley; May 25th, 1910, Netley Heath, Surrey; a male, May 25th, 1907, Tetcham Common, and a specimen, May 28th, 1910, near the same place; one male, May 28th, 1908, Bude, Cornwall (from Dr. T. A. Chapman); a male, June 1st, 1901, Byfleet Canal; June 2nd, 1897, Oxshott; a male, June 4th, 1904, Bookham Common; June 6th, 1903, Horsley; a female, June 10th, 1902, Kew Gardens, Surrey; June 12th, 1910, between Claygate and Oxshott; a male,* June 13th, 1906, near Haslemere, Surrey; a female, June 19th, 1909, between Ashford and Burford Bridge; June 20th, 1896, one, Byfleet Canal, and some specimens in the same locality, June 24th, 1903; June 24th, 1908, near Hindhead; two females, July 6th, 1904, near Hindhead; Swanage, Dorset, August 15th, 1902; a female, August 17th, 1907, New Forest, and the species again in New Forest, at Hurst Hill, August 19th, 1906; a few, August 23rd, 1899, between Lynmouth and Brendon, Devon; August 26th, 1897, and August 29th, 1900, Bagley Wood, Berks; September 10th, 1900, the Coverts, near Claygate.

P. COGNATA.—On one occasion only have I taken this species—a female, July 23rd, 1904, at Byfleet Canal, Surrey. Folkestone, Kent, is another locality; while McLachlan thought it was most frequent in the New Forest. Perhaps it is a later insect than the other two.

Although it involves a considerable amount of repetition, I have given the list almost without condensation in order to shew the time of the year when the imagines appear to be most frequent. Perhaps other naturalists may be able to supply similar dated locality lists, and so add to our knowledge of the distribution and period of flight of these insects.

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* Almost immaculate, the chief markings being a black apex to all the wings, and a spot on the costa at the pterostigma.

P. COMMUNIS.	P. COGNATA.	P. GERMANICA.
1. Size larger.	1. Size intermediate.	1. Size smaller.
2. Markings on wings arranged more or less in bands.	2. General appearance of markings rather suffused.	2. Wings have the appearance of being spotted, rather than banded.
3. Colour of markings on wings approaching black.	3. Ditto, brown.	3. Ditto, as *P. communis.*
4. Antepenultimate segment conical. (Plate IV. fig. 1 *d.*)	4. Ditto, cylindrical. (Plate IV. fig. 2 *c.*)	4. Ditto, conical (last two joints and forceps hairy.) (Plate IV. fig. 3 *e.*)
5. Appendices of male linear, curved. (Plate IV. fig. 1 *e.*)	5. Ditto, linear, straight. (Plate IV. fig. 2 *d.*)	5. Ditto, flattened, dilated and truncated at apex. (Plate IV. fig. 3 *f.*)
6. Rostrum castaneous, with two longitudinal blackish stripes.	6. Ditto, reddish, with scarcely darker stripes.	6. Ditto, testaceous, with two longitudinal indistinct fuscous stripes.

[No. 6 can scarcely be relied upon; but the species may be distinguished with certainty by means of Nos. 4 and 5.]

Boreus hyemalis (Plate IV. 4), the remaining British representative of the group, I have never succeeded in finding, although I have occasionally made search for it. Mr. K. J. Morton, who finds it near Edinburgh, once (*in litt.* Nov. 20th, 1908) sent me suggestions with regard to searching for the elusive little creature, and no doubt he will not mind my publishing them. He says:—"*Boreus* may be a little local, but it is certainly widely distributed. I suppose the mode of taking it is that adopted by coleopterists for catching moss-frequenting beetles. Try moss-covered walls, both top and base, mossy banks, and open woods where there is a good growth of moss around the foot of the trees. The best moss is not that which grows in close cushions, but the more luxuriant sorts which allow of a good handful being torn away from the earth. This should be carefully separated with the hands and shaken, the operation being performed over a newspaper. If the little beast is there, he usually shews his presence by jumping."

Compared with the scorpion-flies, *Boreus* is a tiny creature, the figure (Plate IV. 4) being magnified about two and a half times. The wings are quite rudimentary, but the beak-like head reveals its relationship with *Panorpa*. Again we have to look to Brauer

(Verh. d. zool.-bot. Ver. in Wien, 1855, pp. 711-712, and 1862, pp. 320–323) for much of what little we know of the insect. The larva lives in earth or amongst moss. Pupation takes place also in the earth early in the autumn, and the imago is found in the winter from about October till March. The northern part of Great Britain seems to be its headquarters, though it has been taken in the London district—at Southgate and near Croydon, for instance—and there is little doubt that coleopterists who work in the winter could without difficulty supply us with fresh localities.

EXPLANATION OF PLATE.

1. *Panorpa communis.* *a*, typical male (nat. size), Byfleet, Surrey, June 1, 1901; *b*, typical female (nat. size), Oxshott, Surrey, June 21, 1901; *c*, female with aberrant wing coloration (nat. size), Castle Howard, Yorks; *d*, extremity of abdomen of male (magnified); *e*, appendages of ventral surface of forceps of male (much magnified); *f*, head (× 11).

2. *P. cognata.* *a*, male (nat. size), Folkestone, Kent, August 16, 1895; *b*, female (nat. size), Folkestone, August 10, 1895; *c*, extremity of abdomen of male; *d*, appendages of ventral surface of forceps of male.

3. *P. germanica.* *a*, typical male (nat. size), Bookham Common, Surrey, June 4, 1904; *b*, typical female (nat. size), Swanage, Dorset, August 15, 1902; *c*, var. of male (nat. size), Huddersfield, Yorks; *d*, var. of female, Tongue, Sutherlandshire (nat. size); *e*, extremity of abdomen of male; *f*, appendages of ventral surface of forceps of male.

4. *Boreus hyemalis*, female (× 2·4).

[Figs. 1 *d*, *e*; 2 *c*, *d*; 3 *e*, *f*, are after McLachlan.]

I have to thank Mr. G. T. Porritt for the loan of the insects numbered 1 *c*, 2 *a*, 2 *b*, 3 *c*, and Prof. E. B. Poulton for that of 3 *d*.

28, Knight's Park, Kingston-on-Thames:
June, 1910.

SOME NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 179.)

Chrysæglia magnifica taiwana, ab. n.

The ground colour is paler than in typical *magnifica*, and the markings are bluer and more metallic; the spot on the inner margin of the fore wings unites with the costal border.

Collection number, 751*a*.

A male specimen from Kanshirei (1000 ft.), August 13th, 1908.

Diacrisia clava, sp. n.

♂. Head and thorax brownish buff, the latter with a black dot on each side; abdomen reddish above, suffused with blackish, except at the base, and barred with black. Fore wings brownish buff with a faint pinkish tinge on the basal two-thirds, and a fuscous suffusion on the outer third; the costa black on basal third; a small black mark, with spot below it, on the middle of the costa; a black club-like mark on middle of the inner margin, the end nearest the base of the wing surmounted by a black dot; from the other extremity a dusky shade runs to a series of five black dots from the apex. Hind wings paler buff, suffused with reddish towards the base; a black spot in the cell, one above the middle of outer margin, and two towards the anal angle. Under side as above, but the basal half of the fore wings clouded with reddish.

Expanse, 54 millim.

Collection number, 1786.

One male specimen from Rantaizan, May 10th, 1909.

This species is near *D. abdominalis*, from the North-west Himalayas.

Gargetta (?) *nigra*, sp. n.

♂. Head, thorax, and fore wings fuliginous, the latter with some white scales on the discocellulars. Hind wings smoky grey.

Expanse, ♂ 42 millim., ♀ 40 millim.

Collection number, 705.

One example of each sex from Arizan, September 11th, 1906.

The antennæ, which are two-thirds the length of costa, are bipectinated in both sexes, but in the female the branches are only about half the length of those of the male.

Opisthograptis punctilineata, sp. n.

♂. Canary-yellow. Fore wings with two sinuous, dusky lines before the middle, and an obscure dentate line beyond the middle; the outer line is dotted with chocolate-brown at the veins, and the others commence in small purplish brown marks on the costa; a purplish brown mark at the base, and a larger one on the costa just beyond the middle; from the costal mark a somewhat pyriform spot, outlined in chocolate-brown, extends downwards to the median nervure, and encloses a transparent crescent. Hind wings have a blackish discal mark, a dusky central line, and traces of a faint submarginal line. Fringes of all the wings dotted with chocolate-brown at ends of the veins, but not below vein three on fore wings. Under side as above, except that the submarginal line of the hind wings is more distinct, and the central line very faint.

Expanse, 50 millim.

Collection number, 1671.

One male specimen from Rantaizan (7500 ft.), May 11th, 1909.

Near *mölleri*, Warr, but differs chiefly in the maculation of the postmedial line.

Tristrophis (?) *ramosa*, sp. n.

♂. Fore wings yellowish white; ante- and postmedial bands narrow, blackish, the first oblique from costa to inner margin, along which it is continued to the curved second band; the bands are also united by blackish along the median nervure and its third branch;

the costal area between the bands and the outer area beyond the postmedial streaked with blackish; marginal band and fringes blackish. Hind wings whitish, with the dark markings of the under side showing through; outer area with dark greyish striæ, the veins yellowish, and two black spots near the margin. Under side similar to above, but the hind wings are yellow tinted and irregularly spotted with blackish.

Expanse, 44 millim.

Collection number, 1672.

One male, Arizan, 1908 (7300 ft.).

Odonestis ochreipuncta, sp. n.

♂. Fore wings red-brown, paler and sprinkled with violet-grey on the outer area beyond the oblique line; the latter, which is blackish faintly edged inwardly with violet-grey, runs from about middle of the inner margin to the costa just before the apex; the submarginal line is blackish and serrated; discoidal mark pale ochreous, minute. Hind wings brown, the inner area clothed with red-brown hair. Fringes of all the wings paler, and faintly chequered with darker. Under side brown, inclining to reddish on inner area of all the wings, veins reddish; the hind wings have a diffuse, dusky, median shade, and the oblique line of the fore wings is represented by a dusky shade.

♀. Similar, but on the upper side there is less red in the general colour, and on the under side the reddish tint is entirely absent.

Expanse, ♂ 48 millim., ♀ 60 millim.

Collection number, 719.

A male specimen from Arizan (7300 ft.), September 13th, 1906; and a female from Jujimichi (6500 ft.), September 17th of the same year.

A common species, near *albomaculata*, Brem.

Odonestis nigropuncta, sp. n.

♂. Fore wings pale ochreous brown, clouded with darker brown at the base, and between the veins on outer margin; the costal area is broadly suffused with darker brown, inclining to reddish; a dark oblique band runs from about the middle of inner margin to the costa near apex—it is composed of an outer series of brown spots between the veins, and an inner series of blackish lunules; discoidal spot black, with a dusky mark before it and another above it; a double series of black submarginal dots (failing towards the costa), those of the inner series are under the veins, and those of the outer series are above the veins; fringes dark brown, paler at ends of the veins. Hind wings brown with a slight cupreous tinge; fringes paler. Under side pale brown; fore wing suffused with darker brown on costal area, oblique postmedial band dusky; hind wings with a dusky curved postmedial band.

Expanse, 46 millim.

Collection number, 1192.

Three male specimens from Kanshirei (1000 ft.), June 7th, 1907, April and August, 1908.

An extremely common species at light.

Crinocraspeda (?) *excisa*, sp. n.

♂. Antennæ with long dark brown branches, graduated to the tip. Fore wings brown, tinged with reddish on the central area, mottled and suffused with greyish, especially on the costal area; a pale, wavy, transverse line on the outer marginal area is deeply incurved about the middle, and again before the inner margin; this line is inwardly bordered by a fuscous shade; apical half of the outer margin clouded with fuscous; a black discal dot, beyond which the veins are finely marked with blackish. Hind wings deeply excised on the middle of costa, crenulate on the outer margin, and deeply notched above vein six; brown with a blackish patch, outwardly edged with white, on middle of costal area; the veins beyond the patch black flecked with white; abdominal area clothed with pale brown hairs. Under side of the fore wings much as above, but rather paler, veins clearly defined; hind wings pale brown, mottled and clouded with blackish; a black antemedial line, veins beyond the line black flecked with white.

Expanse, 46 millim.

Collection number, 1675.

One male specimen from Arizan (7300 ft.), August 23rd, 1908.

Metanastria arizana, sp. n.

♂. Fore wings reddish brown; a whitish dot at end of the cell; ante- and postmedial lines black, serrate, the latter curved, the former angled about middle and inwardly edged with whitish; space between the lines dark red-brown; submarginal series of blackish marks connected by a dusky line, and outwardly edged with greyish, most distinct towards the inner margin; on the middle of the outer margin is a dark red-brown cloud. Hind wings pale reddish brown, with narrow central bands of a darker hue on each wing.

♀. Much darker brown, the reddish tint only in evidence on the basal area and beyond the postmedial.

Expanse, ♂ 54 millim., ♀ 62 millim.

Collection number, 720.

One example of each sex from Arizan (7300 ft.); the male taken in September, 1906, and the female in August, 1908.

A common species at light.

Miresa fulgida, sp. n.

♂. Face and antennæ red-brown, head and thorax golden yellow; abdomen yellowish, edges of the segments tinged with red-brown dorsally. Fore wings red-brown, darker on costal area; a diffuse patch of silvery scales in the cell, and a triangular silvery patch beyond the cell—the latter has its base on the silvery postmedial line between veins three and five, which at this point and inwards are also silvery;

the area beyond the postmedial is suffused with greyish, and outwardly edged with silvery. Hind wings ochreous brown. Under side ochrecus brown, veins paler; costal area of the fore wings suffused with reddish brown.

♀. Similar, but the silvery patch in the cell is less diffuse, and the under sides of all the wings are rather darker.

Expanse, ♂ 34 millim., ♀ 40 millim.

Collection number, 666.

One example of each sex from Kanshirei (1000 ft.); the male was captured April 24th, 1908, and the female June 17th, 1907. Allied to *M. bracteata*, Butl.

Chelura pica, sp. n.

♂. Antennæ black, branches rather long; head and thorax blackish, the latter brown tinged in front. Fore wings black, with four white spots in the cell, one at the outer end of the cell, and a series of four white spots between veins two and six; the spaces below vein two white, except on the outer marginal area, each broken by a blackish line. Hind wings white, outer margin with a rather diffuse blackish border; veins blackish. Under side similar to the upper side.

Expanse, 43 millim.

Collection number, 1678.

A male specimen from Arizan (7300 ft.), July, 1908.

(To be continued.)

MELITÆA BRITOMARTIS AND ITS ANCILLARY APPENDAGES.

By T. A. Chapman, M.D., F.Z.S., &c.

It is no doubt somewhat rash to differ from Mr. Wheeler on a question affecting the Melitæas, and I do not write this to do more than call attention to the fact that Mr. Wheeler ('Entomologist,' p. 163, 1910) does me rather less than justice in citing my opinion on *M. britomartis* (Reazzino) as an instance of founding an opinion on the characters of the male appendages alone.

This is far from being the case. I did not recite at length the whole question as to the claims of *britomartis* to specific rank, but perhaps I ought to have mentioned my own position in the matter. I also failed to say that I am fully assured of the extent of my own ignorance, and that my opinion is open to revision by myself or anyone else, on the appearance of any new evidence. I often make some such statement, but with a feeling that it is rather absurd to do so, since it is only under such conditions that either I or anyone else can make any statement, either as to fact or opinion, and to recite these conditions is, as mathematicians use the word, not significant, and is mere verbiage. It clearly, however, possesses uses on occasion, as I might thereby have avoided ruffling my friend's amiable serenity.

My position in the matter is, however, more apposite; it was this: Examining the specimens and taking into account all that Mr. Wheeler has told us about them, I was strongly of opinion that *britomartis* (Reazzino) was a form of *dictynna*, not of course identical with *dictynna*, but a special form or race. I had doubts about it, founded rather on deference to Mr. Wheeler's opinion than on my own weighing of the facts. I wanted some further evidence, and felt that further evidence one way would strengthen these doubts; the other way, would do away with them.

The new item was the structure of the male appendages, and as these agreed with those of *dictynna*, I was satisfied that, so far as I could form an opinion, *britomartis* was a form of *dictynna*.

That I was fully justified in my attitude of doubt, pending this reference, may be deduced from the opinion of Mr. Wheeler himself, given to the Entomological Society. He is reported in the 'Entomologist,' vol. xli. p. 94, as saying that "the close affinity with *M. dictynna* made separation superficially very difficult, and until all forms were reared from the ovum it would be impossible to determine whether *britomartis* constituted a separate species or not."

There can be no doubt, of course, that definite evidence from the early stages would put the question on a new and firmer basis.

I was unable to accept, on the facts Mr. Wheeler advanced, that *britomartis* is "undoubtedly double-brooded." He took it in June and in July in different seasons, and considered the June season a late one, and that these were first and second broods. The season 1907 was possibly not so late south of the Alps, as in the Rhine Valley; on the Riviera, it was fairly average. Assuming it to be double-brooded, this is an important fact, but far from conclusive as to the specific position of *britomartis*. I do not know whether Mr. Wheeler intended to describe the palpi and antennæ of the two forms as different; he uses different phrases, and seems to imply that we have here good specific characters. My observation is to the effect that the antennæ and palpi in the two are identical. I might go over the other items; but this is unnecessary, since the point we are discussing is that they left me fairly satisfied that *britomartis* is *dictynna*.

I may mention, however, that in Mr. Lang's series of *dictynna*, which I have, are several specimens, curiously without data, but which agree very closely indeed with *britomartis*, showing that Lang was of opinion that this form was only one of *dictynna*. Tutt has also expressed a similar opinion as to *britomartis*.

I cite this, since Mr. Wheeler's datum seems to be that the proof that *britomartis* was a good species was so strong that nobody could possibly be of a contrary opinion; and that when I cited the last straw as determining my views, I was making it outweigh the whole of the rest of the load, instead of merely adding a trifle to it.

On the general question on which I am held up to censure, my position has always been that the male armature presents useful characters, just as any other part of the insect does, and that these characters are to be valued at neither more nor less than any others. They have the advantage of being those of hard chitinous parts, with none of the indecision of wing markings and colours. They often present decisive characters when others fail; they also fail sometimes where other characters leave us in no doubt. The only ground on which they *appear* to claim superior value is that they are often the last referred to, and seem therefore to be regarded as decisive in a way that would not at all occur had they been taken into account at first instead of last.

Betula, Reigate.

DESCRIPTIONS OF THREE NEW SPECIES OF INDIAN RHYNCHOTA.

By W. L. Distant.

HETEROPTERA.

Fam. PENTATOMIDÆ.

Subfam. ASOPINÆ.

Anasida orientalis, sp. n.

Black; a central castaneous spot on basal margin of head; head rugosely punctate, about two-thirds the length of pronotum, lobes of equal length, lateral margins moderately concavely sinuate, ocelli reddish, the basal area less rugosely punctate than the anterior area; antennæ slightly pilose, with the first joint short, not reaching apex of head, second shorter than either third or fourth, which are subequal in length, fifth scarcely shorter than fourth; pronotum rugosely punctate, the lateral margins remotely crenulate and somewhat strongly sinuate, the posterior lateral angles prominent and inwardly longitudinally depressed, before anterior margin two transverse obscurely opaque slightly punctate cicatrices; scutellum transversely rugosely punctate; the apex truncately rounded; corium opaque, finely punctate, the costal area more coarsely and thickly punctate; membrane moderately passing the abdominal apex; rostrum reaching the intermediate coxæ; sternum coarsely and somewhat sparingly punctate, the abdomen thickly and rugosely punctate; legs unarmed, tibiæ above longitudinally sulcate. Long. ♂ 17 millim., ♀ 18 millim.

Hab. Bombay Province; Dharwar.

This first discovered Oriental species of the hitherto regarded Ethiopian genus *Anasida* was found by Dr. Harold Mann among stones in a railway cutting.

This species is allied to *A. funebris*, Dist., from Natal, and is the first species of the genus described from outside the Ethiopian region.

HOMOPTERA.

Fam. JASSIDÆ.

Subfam. LEDRINÆ.

Petalocephala granulosa, sp. n.

Pale virescent; vertex shorter than breadth between eyes, finely punctate, centrally longitudinally finely subcarinate, the lateral margins oblique from a little in front of eyes, and narrowing to apex which is subacute; eyes brownish; pronotum with the basal area a little darker in hue, where it is finely granulose, the lateral and anterior margins distinctly narrowly darker, the posterior margin strongly concave before scutellum, which is somewhat thickly finely punctate; clavus thickly punctate, and with a few fine granules; tegmina subhyaline, thickly finely punctate, the apical margin narrowly black, inwardly narrowly longly dentate; body beneath and legs virescent. Long. incl. tegm. 8 millim.

Hab. Bengal; Pusa (Lefroy).

Most nearly allied to *P. nigrilinea*, Walk.

Mr. Maxwell-Lefroy, in forwarding me specimens of this species, says:—"We have reared this from nymphs which are fixed to mango-leaf, very tightly pressed down on to it so as to be very difficult to see; they are more or less transparent, and sit motionless very much as a scale-insect does. They are not common."

Subfam. TYPHLOCYBINÆ.

Empoasca thea, sp. n.

Bright pale olivaceous green; eyes black; tegmina either with the apical area greyish white, or greyish white with the basal area and costal margin green; body beneath and legs pale olivaceous green; vertex rounded, more than twice as broad than long; scutellum strongly transversely impressed before apex; tegmina considerably passing abdominal apex, with a distinct elongate discal cell before the apical cells. Long. incl. tegm. 4 millim.

Hab. Cachar (Antram).

Mr. Charles B. Antram sent me this species, found as a very destructive pest to tea-gardens in company with *E. flavescens*, Fabr.

I use the genus *Empoasca* in the comprehensive sense explained in my 'Indian Rhynchota,' iv. p. 401.

NEW HYBRID BISTONINÆ.

By J. W. H. Harrison, B.Sc.

I have succeeded in producing several "*Biston*" hybrids, and in order to secure leisure for an extended and detailed study of their early stages, and at the same time to protect myself from being forestalled, I am publishing this preliminary statement of their names.

Before doing so I must point out that Mr. L. B. Prout has shown that our ordinary English applications of the various generic names are incorrect, and that the following are the valid names:—

(1) *Biston* is inapplicable to *hirtaria*; as *strataria* was selected as the type, *Amphidasys* sinks to this as a synonym.
Lycia, Hübner, 1826 (type *hirtaria*, selected by Hulst in 1896), must be accepted.

(2) *Apocheima*, type *hispidaria*, cannot be used for *zonaria*, which is generically distinct.
Ithysia, Hübner (1826), must be used, therefore, instead. Type *zonaria* (Hulst, 1896). *Nyssia*, Duponchel, sinks to *Ithysia*.

(3) This leaves the three species, *pomonaria*, *lapponaria*, and *rachelæ* without a generic name.
In anticipation of my detailed paper, I propose the name *Pœcilopsis* for the rough-haired, red-speckled forms named above, with type *pomonaria*.

(4) Although I am not dealing with the species usually known as "*Biston*" *græcaria* and "*B.*" *alpina*, as they also require a generic name, I propose *Melanocoma*. Type *alpina*.

The hybrids, of which a list appears below, are without exception named after those who have taken an interest in and have supplied material in the past for their production. In England my special thanks are due to Messrs. Denham and Smallman for help with *zonaria* and *lapponaria*, whilst for *pomonaria* I have to thank my esteemed friend Herr Lange, of Freiberg.

Ithysia, hybrid *langei* = *I. zonaria* ♂ × *Pœcilopsis pomonaria* ♀.

Ithysia, hybrid *harrisoni* = *I. zonaria* ♂ × *Lycia hirtaria* ♀.

Pœcilopsis, hybrid *smallmani* = *P. lapponaria* ♂ × *Ithysia zonaria* ♀.

Pœcilopsis, hybrid *helenæ* = *P. pomonaria* ♂ × *Ithysia zonaria* ♀.

Lycia, hybrid *denhami* = *L. hirtaria* ♂ × *Ithysia zonaria* ♀.

The bulk of the specimens reared were wasted in further experiments with practically no result. In one case *Ithysia*, hybrid *harrisoni* ♂ × *Lycia hirtaria* ♀, two ova proved fertile, and of these one hatched and may feed up. For convenience I call this hybrid larva hybrid *goodwini*.

I have not attempted to repeat Mera's experiments with *Ithysia zonaria* ♂ × *Pœcilopsis lapponaria* ♀ (= hybrid *merana*, Burrows), but have reared several very large broods of the *hirtaria-pomonaria* hybrids. These are:—

Lycia, hybrid *pilzii* (Standfuss) = *L. hirtaria* ♂ × *Pœcilopsis pomonaria* ♀.

Pœcilopsis, hybrid *hunii* (Oberthür) = *P. pomonaria* ♂ × *Lycia hirtaria* ♀.

I have found it so very difficult to obtain the former cross that I have often thought that the original specimen taken wild by Pilz might have been a specimen of the latter hybrid.

NOTES ON THE VARIETIES OF *PERONEA CRISTANA* LATELY IN THE COLLECTION OF THE LATE MR. J. A. CLARK.

By Sydney Webb.

Capucina Group.

The variety which gives its name to this group of pale coloured forms *P. cristana* was captured by the late Rev. Mr. Johnson, and described by him in Ann. Mag. Nat. Hist. 1842, three years before Desvignes discovered the far commoner *subcapucina*. Both are well known to collectors, and it is therefore unnecessary to go into further details concerning these two aberrations.

Curtisana, Desv.—The very rare examples that have stood so long in our cabinets under this name are similar to *subcapucina*, but the vitta is very pale yellow. Desvignes gave the name, it would appear, to a variety with a faint fulvous streak from the base to the button, which is of the same colour. He does not mention the vitta, but inasmuch as he speaks of the moth as similar to the last (*subcapucina*), we may presume it to be pure white. I know of no specimen that answers his description, and evidently our old collectors thought there was an error in description, or they would not one and all* have adopted the mistake, particularly as each one prided himself on his accuracy of nomenclature. The *curtisana* recently sold (Clark sale 3, lot 327) was *tolana*, of which Desvignes writes: "Between *curtisana* and *desfontainiana*."

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* S. Stevens, Shepherd, Burney, Mason, Vaughan.

Tolana, Desv.—The last curt description is not sufficient. *Tolana* has a few—from three to five—short pale striæ on the inner third of the costa, of which we see no trace in *desfontainana*, and there is a marked difference in the subsidiary small tufts of scales towards the end of the wings, which we all know are arranged two above longitudinally (occasionally seen in *desfontainana*, but always in *tolana*), and white in colour, and three perpendicularly near the anal angle, also conspicuously white in *tolana*, but if present at all, and that very rarely, fuscous in the other moth. There may also be noticed a white streak near the apex of the wing of *tolana*, never seen in its compeer, and of course the distinguishing white vitta. The central tuft of scales, too, is somewhat paler. It would seem then that the comparison between the two moths by Desvignes was very superficial, adopted only from a casual resemblance of the upper part of the wing, possibly to avoid difficulties of expressing the coloration.

Masoniana.—Clark, n. ab., fig. 17. There were two specimens under this name in the collection quite dissimilar, the lower being an example of the *curtisana* of our cabinets, but the ends of its wings are more mottled with white, which runs down in a series of spots touching each other, so forming a line to the anal angle, whilst the tuft is also pure white. It is labelled "New Forest."

The type specimen, however, is sufficiently described, except in one or two minor particulars; thus, writing of the darker ends of the wings, paler clouds would better have expressed the markings than white spots, and "the fine orange-coloured line which extends along the margin towards the apex" should have been omitted, as it refers to the coloration of the cilia alone, and is not a wing marking. The pin is an ordinary white one, slanting backwards, and no clue is given whence the specimen was derived. A combination of unfortunate circumstances connected with a newly named moth, which we have, however, gathered was formerly in Dr. Mason's collection.

Charlottana, Clark.—Unless this should prove to be identical with the original *curtisana*, now lost to knowledge, we must recognize it as a good variety, and the most beautiful of all. It differs from those forms usually called *curtisana* by an absence of the fascia from the costa before the button, by the white striæ and paler clouds along the costa, and the substantial reddish orange streak from the base to the central tuft, which under no conditions could possibly be called a "faint fulvous one." A few specimens only are known.

Gumpiana, Clark. — Specimens have hitherto been incorporated with our series of *subcapucina*, more uniformly sprinkled with grey and white, of a smoother aspect, and wanting the two white square blotches towards the hind margin, whilst the central tuft was either very small or entirely wanting. These were pointed out to friends years ago as deserving a varietal name, but it was a great surprise, I suspect, to others as well as myself when Mr. Clark gave it this one. Of course he was in error when he said this plain coloured moth had been known many years in our sale-rooms under this name, and Clark afterwards ('Record,' vol. xvi. p. 145) corrects the impression his first article may have made upon his readers by giving Mr. Johnson's definition of *gumpinana* as originally described, but unfortunately he does not withdraw his own erroneous name, so that this well-marked and distinctive variety still awaits a befitting title, and I would propose that it be known as ab. *clarkiana*.

The *gumpinana*, not *gumpiana*, of our older collectors has the central tuft, vitta, and smaller five tufts white, the < angle enclosed between the apex and anal angle, narrowing to the tuft, of the palest violet slate colour, with a narrow red line from the central tuft to near the apex, and an interrupted white dash dividing into two lines below it. The basal part of the wing tinged with reddish brown, and the first two-thirds of the upper part of the wing towards the costa a dirty yellow; this is divided from the central tuft by an extremely pale inconspicuous yellow fascia which seldom crosses the wing. All the colours are very subdued, and the moths thin scaled generally. Head and thorax white. Totally unlike any other form excepting the next, which is somewhat like it.

Two specimens, of which one was labelled "New Forest, 2.10.05," were in Mr. Clark's cabinet as *tolana*; they constituted lots 325, 326 in the catalogue at his sale. Smaller than *gumpinana*, Johnson, they are very strongly coloured. The basal half of the wings of a dirty yellow, with a few reddish markings at the base; the red line from the button terminates on the costa before the apex, and is strongly pronounced; it is continued towards the base after having been interrupted by the central white tuft and pale fascia, then along the top of the nether end of the white vitta to the base of the wing. The white clouds in the hinder third of the wings are distinct and well-defined, as they are in *subcapucina*, and the ends of the wings are red-brown; hence this handsome variety has a much more mottled appearance than *gumpinana*. The button and vitta are pure white, as are the small subsidiary dots towards the hind margin. Of course they have no affinity with *tolana*.

A similar variety to that named *gumpiana* by Clark, but with darker scaling, thus making a slaty-grey or roan-coloured insect of uniform coloration, but large white tuft and vitta, lots 337, 338 were sold as "*gumpiana* or new var."; they were unlabelled, but captured at Folkestone by Mr. William Purdey, who alone has taken this form. As there are now seven specimens known, all precisely similar, it is well they should possess a varietal name, and I propose to call them after their captor. The good work Mr. Purdey has done for entomology in clearing up points of difficulty and original research in the life-histories of many of our Lepidoptera deserve this slight recognition of his services, and the variety will henceforth be known as *purdeyana*.

(To be continued.)

NOTES AND OBSERVATIONS.

Our readers will learn with interest that Mr. Selwyn Image, M.A., Fellow and Member of the Council of the Entomological Society of London, has been elected to the Slade Professorship of Fine Art in the University of Oxford, where, as an enthusiastic disciple of John Ruskin, he graduated in 1872; Ruskin being the first occupant of this particular Chair. Latterly, as Master of the Art Workers Guild, he has done much to develop a taste for art among the more highly educated members of the community, while his love for entomology finds continual expression in the work of designing, upon which his energies are largely concentrated. A poet and an artist, he has among other charming subjects embodied *Hybernia leucophæaria* as the ideal "Spring Usher"; and, at the moment, is putting the finishing touches to the beautiful new seal of the Entomological Society—a labour of love, which, we are sure, will be as much admired as it will be appreciated by all his colleagues and friends who are also of "the brotherhood of the net."

Retarded Emergence of Acronycta megacephala.—On September 4th, 1907, a single larva of this species gnawed out a hole in a piece of virgin cork, and therein formed its cocoon. As no moth had emerged by October, 1908, I partially opened the cocoon, and found the chrysalis alive and healthy. Throughout 1909 I frequently looked in the box, but only to find a healthy pupa. On May 27th last the moth emerged—a fine female, it having lain over *three* winters, and been in a cocoon for a period of two years and eight and three-quarter months. The box containing same was kept in a cold room, and in the same position, throughout this period. As Barrett in 'Lepidoptera of the British Islands' says "this species sometimes remains in cocoon through a *second* winter," I have thought the above worth recording.—W. A. Rollason; "Lamorna," Truro, June 10th, 1910.

Aberration of E. advenaria.—Among some insects taken for me by my brother near Godalming, Surrey, which I received June 5th last, is an almost unicolorous male of this species; it is very much the colour of worn *H. muricata*, and has white fringes. It is of smaller size than usual, and must be very similar to the specimen mentioned by Mr. Oldaker (Entom. xli. p. 157) as having been bred by him in 1907 from ova obtained near Haslemere. The insect seems to swarm in that part of the country, where there is a good undergrowth of bilberry, and I took a series of it there lately. But for the cabinet it should be bred, as really fine specimens are few and far between.—(Captain) P. A. Cardew; 50, Melbury Gardens, Cottenham Park, Wimbledon.

Parasite of Callophrys rubi.—Somewhere in Switzerland—I think in the Val d'Herens—I picked up a larva of *C. rubi* last year, which this spring produced an ichneumon fly. I ought perhaps to say that the pupa of *C. rubi* is so distinct that the determination of the species is not in the least doubtful. The fly emerged by cutting a lid off, consisting of the front of the pupa-case. The specimen is now in the collection of Mr. C. Morley, who says the parasite "is a true ichneumon (*Anisobas platystylus*, Thoms., Ann. Soc. Fr. 1888, p. 122), and is the first parasite ever bred from *Thecla rubi*, so far as I am aware. It was only known from Sweden and France."—T. A. Chapman; Betula, Reigate, June 17th, 1910.

Ephemera danica (Ephemeroptera).—On May 28th last this may-fly was emerging near Slyfield, Surrey, and a few sub-imagines were taken home. One male I watched for a quarter of an hour or so as it was trying to emerge. The thorax-skin split longitudinally, and, as in the Odonata, emergence commenced in that region; next appeared the head. Wings, abdomen, and legs seemed to be coming out more or less together, the legs being perhaps a little behind the rest. The abdomen was arched up, and apparently stuck. Ultimately I tried to help, but without success as regards fore wings and some of the legs. Just before emergence commenced the wings were spread horizontally, while the insect twitched and jerked its abdomen, &c.; it seemed clear that a change was going to take place. Throbbing was noticed in the freshly exposed and shining dorsal part of the thorax. If this emergence was normal, it is clearly a very gradual process, and in some ways resembles that of a dragonfly.—W. J. Lucas.

Triecphora vulnerata (Homoptera).—At the beginning of June, in the coverts between Claygate and Oxshott, Surrey, this rather strikingly coloured froghopper seemed fairly abundant.—W. J. Lucas.

The Capture of some Cicindelidæ in Borneo.—While on a collecting expedition in the early part of this year in the upper waters of the Limbang—one of the great rivers of Sarawak—I witnessed a curious method of capturing Coleoptera, which may perhaps be of interest to entomologists in England who still use the prosaic net. It came about in this way. After a hard day's work paddling up the river against a strong current, we (*i. e.* my five Dyak collectors, six Bisaya coolies, and myself) arrived at a native house, where we determined to pass the night. Accordingly, the two boats were hauled up on to a high sand-bank at the river's edge and we proceeded to disembark. I noticed at once several Cicindelidæ flying over the sand, and soon discovered there were three species, *viz.* the ubiquitous *Cicindela aurulenta*, Fab.—about the commonest beetle in Sarawak—a smaller, red-spotted species, *Cicindela crespignyi*, Bates, and a third species, new to me, which turned out to be *Cicindela opigrapha*, Dejean, a rather local species. After seeing me catch several with my net, a young Bisaya began to do so too, but using a diminutive fishing-rod. His "apparatus" consisted of a thin stick some three feet long, to the end of which he had tied a long hair (it is the custom of the Bisaya men to wear their hair long, and sometimes it reaches well below the waist); to this hair was fastened a bait, made from a small grasshopper. Armed with this, he slowly walked across the sand-bank, dangling his bait carefully over or near any Cicindelid he saw. Whereupon, in nine cases out of ten, the Cicindelid, with feminine curiosity, would walk slowly towards it, and, after slight hesitation, seize the morsel, and thus fall an easy prey to my native entomologist. He had to exercise great care in drawing up the rod evenly, so as to prevent any jerks which might frighten the insect away. In this way he caught quite a number for me, and once the insect had seized the bait, he seldom failed to bring it to the killing-bottle. They told me they had learnt it as a game which they used to play when they were children. I tried it, but without much success; and I warn intending disciples that it is a game that wants practice.—J. C. MOULTON; Sarawak, May 11th, 1910.

CAPTURES AND FIELD REPORTS.

SPRING BUTTERFLIES IN NORTHANTS., BUCKS., AND MIDDLESEX.—After the miserable experience of last year's summer, followed by a wet, cool autumn, and an open winter, it is something of a surprise to find butterflies generally so plentiful both here and the one or two localities which I have had an opportunity of visiting so far. Insects of all kinds were late in making an appearance in this part of Middlesex—among the hybernators in the house the death-roll was unusually large—but once the warm days began they quickly responded, and, compared with the dates of previous years, one or two butterflies are even early. For example, I was on the Bucks. Chiltern Hills for an hour or two last Saturday (June 4th), and although there was not much sun, the commoner sorts were well in evidence—*Euchloë cardamines* and *Nisoniades tages* in even greater profusion than usual; as also the three ordinary "whites." *Callophrys rubi* was swarming, every hawthorn bush and sapling oak when tapped distributing a multitude of worn males, while the females were as common, flitting over the low herbage. *Cœnonympha pamphilus*, a large form and brightly coloured, was also much in evidence; but of the Lycænids, *Polyommatus icarus* did not seem fully out, though I took a specially finely marked female. *P. astrarche*, on the other hand, was well emerged; while I was most pleased to turn up two or three perfect examples of *Cupido minimus*, which for some years has been getting scarcer and scarcer in the several localities hereabouts where the *Anthyllis* blooms freely, and where I am accustomed to look for it.

In a wood on the borders of Northamptonshire and Hunts. a week previously (May 28th) I had the good fortune also to note a similar abundance of ordinary butterflies, the glades being particularly affected by *Satyrus* var. *egerides* and *Gonepteryx rhamni*, with occasional *Argynnis euphrosyne*. *Cyclopides palæmon* was also seen in such numbers as to promise a plentiful season for this loveliest and rarest of our "skippers," while the last capture of a very short day's work—due to a disappointing change of weather—was a perfectly fresh male *Nemeobius lucina*.

Two days previously, in Oxhey Wood (Herts.), *Hesperia malvæ* was as common as ever I have known it, though I fear all collecting on this once "happy hunting-ground" is doomed, as the builders are at work, and Civilization in the form of a three-foot sewer has invaded this last surviving part of the primitive woodland of our Middlesex north border! Lastly, it is satisfactory to find that *Celastrina argiolus* still holds its own, and despite the drenching of ivy and holly-buds last year made a welcome reappearance in our garden on May 22nd; the females a couple of days later.

It is, perhaps, worth recording also (though scarcely a "*field*" report!) how extremely common were *Pieris brassicæ* and *P. rapæ* in the streets of London on the day of the King's funeral, May 20th; from quite an early hour these butterflies crossing and recrossing unmolested above the thousands of close-packed humanity in Piccadilly, where I happened to be stationed.—H. Rowland-Brown; Harrow-Weald, June 6th, 1910.

Amphidasys betularia ab. doubledayaria in Essex.—I have to-day, May 21st, taken here a fine female specimen of *A. doubledayaria*. This is perhaps a record for Essex, but some of your readers will know better than I.—(Rev.) W. Claxton; Navestock Vicarage, Romford.

Lepidoptera at West Wickham.—It may be of some interest to record that on June 6th I took a specimen of *P. piniperda* at sugar at West Wickham. This seems a very late date for this species, but in spite of that it was in very fair condition. The same evening I also took by "lamping" *N. dodonea*, *C. fluctuosa*, *L. dictæoides*, *T. batis*, *B. consortaria*, and *M. albicillata*. I have had some opportunity of working this once famous locality during the past few years, and amongst the better captures the following may be mentioned:—*H. bicolorana*, *A. flavicornis*, *A. leporina*, *O. suspecta* (sugar), *N. neglecta*, *N. stigmatica*, *B. parthenias*, *N. hispidaria* (larvæ), *C. glabraria* (one larva), *E. dolobraria*, *P. bajularia*, *T. luridata*, and *M. notata*. But my experience is that you have to work pretty hard for what you get. Sugar, for the most part, has been a dismal failure, and more often than not the trees sugared have failed to produce a dozen insects altogether.—(Rev.) E. Mannering; 74, Bolsover Street, W., June 9th, 1910.

SOCIETIES.

Entomological Society of London.—*Wednesday, May 4th, 1910.*—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—The decease was announced of Mr. G. S. Saunders, F.L.S., a Fellow of the Society.—Mr. J. J. Ward brought for exhibition an example of the ichneumon-fly, *Rhyssa persuasoria*, female, together with a photograph of the living insect. The specimen was captured at Coventry; but whether that place was its natural habitat is doubtful, as some packing straw from Geneva was lying in the vicinity.—Mr. H. St. J. Donisthorpe exhibited, on behalf of Dr. Nicholson, Mr. Dollman, and himself, examples of a beetle new to science, an *Olophrum* and Scotch specimens of *Olophrum fuscum*, the species to which it comes nearest, for comparison. The new beetle had been discovered by him and Dr. Nicholson in Wicken Fen under sedge refuse, and subsequently by Mr. Dollman in some numbers in the same locality.—Mr. Donisthorpe pointed out the characters in which it differed, and said he had described it, and proposed for it the name of *Olophrum nicholsoni*.—Mr. H. Eltringham stated that in reference to his previous paper describing experiments on the edibility of certain lepidopterous larvæ (Trans. Ent. Soc., 1909, pp. 471–478), the caterpillars there referred to as *Boarmia rhomboidaria* had proved to be *Odontopera bidentata*. Further, that some of the moths had been bred from larvæ fed exclusively on ivy, and though similar larvæ had, as explained in the paper referred to, proved extremely distasteful to the lizards with which he had experimented, the moths were found to be palatable. His lizards having failed to survive the winter, he had sent the moths to the Zoological Gardens, where Mr Pocock had given one to a bird and two to some lizards (*Lacerta viridis*), and all of the moths were devoured at once. The result appeared to show that the distastefulness of the larvæ was due to the particles of the food plant contained in the digestive tract.—Mr. E. Meyrick, B.A., F.R.S., communicated a paper entitled "Descriptions of Micro-Lepidoptera from Mauritius, and the Chagos Isles."

Wednesday, June 1st, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—The President proposed that an Address of Condolence and Congratulation should be presented by the Society to His Majesty King George V. on his accession to the throne. The proposal was seconded by Mr. H. Rowland-Brown, one of the Hon. Secretaries, and carried unanimously, all Fellows present standing.—Mr. Arnold Whitworth Boyd, The Alton, Altrincham, Cheshire; Mr. Emile Garcke, M.I.E.E., Witton House, Maidenhead; Mr. Henry Oliver Holford, Elstead Lodge, Godalming; Count Briger Morner, Consul for H. M. the King of Sweden, Sydney, New South Wales; Mr. C. W. Mason, S.E.A.C., St. Denis, Shaftesbury, Dorset; Mr. Martin E. Mosely, 13, Addison Road, London, W.; Mr. Robert Tait, junior, Roseneath, Harboro' Road, Ashton-on-Mersey, Cheshire; Mr. Frank Wray Terry, The Planters' Association, Honolulu, Hawaiian Islands; Mr. F. V. Theobald, M.A., South Eastern Agricultural College, Wye Court, near Ashford, Kent; Mr. Charles Henry Rudge, Assoc.M.Inst.C.E., 15, Newton Road, Bayswater, W.; and Miss Carlotta Rudge, 15, Newton Road, Bayswater, W., were elected Fellows of the Society.—The President announced that the Conversazione, postponed from Friday, May 27th last, by reason of the general mourning for his late Majesty King Edward VII., would be held during the forthcoming session on some date not earlier than the last week in November.—Commander J. J. Walker exhibited examples of *Ceuthorrhynchideus mixtus* and *C. pilosellus* taken by him during May last at Tubney, Berkshire.—The Rev. F. D. Morice showed a specimen of the Pompilid *Clavelia pompiliformis*, Luc., male; probably the only fossorial wasp with pectinated antennæ, taken by him this spring in the province of Oran, Algeria; also examples of the saw-fly *Phymatocera aterrima*, Klug, with photographs of the insect in the act of ovipositing on "Solomon's Seal," and gave an account of the way in which the saws are employed for the purpose. Instead of cutting vertically the saws are turned sideways.—Mr. H. Main brought for exhibition an empty larva skin of a male *Lampyris noctiluca* with a living pupa, which was seen to be intermittent luminous.—Mr. L. Newman showed a long and varied series of *Ematurga atomaria*, bred from a melanic female taken *in cop.* with a dark typical male at Bury, Lancashire. It was noticeable that the melanic and semi-melanic forms predominated in the offspring.—Mr. Newman also exhibited a male and female of (?) hybrid *Agriades thetis* (*bellargus*) × *A. corydon*, taken wild in North Kent, June, 1909, by Sergt.-Major W. Crocker, and ova *in situ* of *Sesia andreniformis*, of which also Mr. A. E. Tonge handed round a photograph, × 26.—Mr. O. E. Janson showed a remarkable gynandromorphous example of *Goliathus giganteus* and other *Cetoniidæ* recently collected by Mr. E. Brown in Uganda, British East Africa, including both sexes of the rare *Formasimus russus*. Nearly all the species exhibited were West African forms, proving the great similarity of the central African fauna, extending over a district of two to three thousand miles across that continent.—The Rev. G. Wheeler brought for exhibition a case containing many examples, bred from identical parents, of *Smerinthus populi*, taken in Lancashire, showing a wide range of variation; also a curious pale dwarf example of *S. ocellata* from the same locality.—Mr. C. O. Waterhouse exhibited specimens of a beetle of the family Chrysomelidæ, *Crosita altaica*, found by a poulterer at Bournemouth in the crop of a pheasant from Russia. He remarked on the brilliancy of the metallic coppery-red and green colours, held by some to be warning-colours.—Dr. T. A. Chapman exhibited specimens of the spring emergence of double-brooded *Agriades corydon*, taken in April and May last in the Riviera, at various dates from April 23rd to May 11th, displaying considerable variation, but all apparently of one race. He also showed larvæ of *Thestor ballus* in the last instar, feeding on flowers of *Ulex europæus*; a larva of *Agriades corydon* var. *constanti*, from eggs laid at Ste. Maxime at the beginning of May, and now in the third instar; and a living imago of *Callophrys avis*, Chpmn., a somewhat belated specimen, emerged June 1st, 1910;, the delay no doubt due to an unsuccessful attempt at forcing in February.—Dr. K. Jordan exhibited a live male specimen of a species of *Truxalis* obtained by him at Portimão, South Portugal, and also showed living larvæ and the cocoon of a moth, *Diplura loti*, found on *Cistus* in the Serra de Monchique, Algarve, South Portugal, on May 13th. They resemble the caterpillar of *Eriogaster lanestris* so closely that a generic separation is hardly justified.—Mr. H. H. C. J. Druce communicated some notes received from Mr. J. C. Moulton, of the Sarawak Museum, on the association of a Homopteron with a Lycænid butterfly observed in Borneo. The following papers were read:—"Mr. A. D. Millar's Experimental Breeding of *Euralia*," by Roland Trimen, M.A., F.R.S., F.L.S.; "Notes on the Scoliidæ," and "New Fossorial Hymenoptera from Australia," by Rowland E. Turner, F.E.S.; "On the position of the Rhopalosomidæ, with Description of a Second New Species," by Claude Morley, F.E.S.; "Descriptions of Malayan Micro-Lepidoptera," by Edward Meyrick, B.A., F.R.S., F.Z.S.; "On the Specific Distinctions between *Achræa lycoa*, Godt., and *Achræa johnstoni*, Godm.," by Harry Eltringham, M.A., F.Z.S.—The following Fellows will represent the Society as delegates to the International Congress of Entomology at Brussels: Dr. F. A. Dixey, M.A., M.D., F.R.S., President; Mr. H. St. J. Donisthorpe, F.Z.S., Mr. F. Merrifield, and Mr. R. Trimen, M.A., F.R.S., F.L.S.—H. Rowland-Brown, M.A., *Hon. Secretary*.

RECENT LITERATURE.

A Natural History of the British Butterflies. By J. W. Tutt, F.E.S. Vol. iii. London: Elliot Stock, 62, Paternoster Row, E.C.

The third volume of Mr. Tutt's monumental work on the British Butterflies will appeal not only to native collectors and students of the rather limited butterfly fauna of these islands, but to the many who are extending their researches to the wider sphere of the palæarctic region generally. For example, there are two species, now for the first time exhaustively treated, which have proved something of a stumbling-block to most of us—*Everes argiades* and *Plebeius argus* (*ægon*). Continental authorities have expressed their suspicions about var. *alcetas*, Hb. (*coretas*, O.), for some time; and M. Charles Oberthür has already pointed out the main differences between the hitherto so-called variety and the type. Mr. Tutt completely diagnoses both as separate species; and we can only say that we wish *E. argiades* had a better claim to be regarded as an indigenous species. So elaborately is the subject treated, however, that no entomologist who has read these closely printed pages of life-history should fail to recognize his capture at whatever stage effected; and it is to be hoped that something of the meticulous industry displayed by the author in the study will communicate itself to the observer in the field on the look-out for what, with fine insular exclusiveness, we have dubbed "the Bloxworth Blue." Yet the confusion, hitherto existing in the case of the two Everids, is as nothing compared with that involved with *Plebeius argus* (*ægon*, Schiff.) and *P. argyrognomon* (*argus*, auctorum), though British writers have not been quite so hopelessly inconsistent in their classification of the two species as those of the Continent; for the good reason, probably, that so far *P. argyrognomon* has not turned up in the United Kingdom, even in the imaginative literature of the early Aurelians! Now we know, however, that structurally the two butterflies, which some have found so difficult to separate, present sufficiently striking differences; while all sorts of varieties and forms referred to one should by rights have been attributed to the other. Mr. Tutt, beginning from the beginning, considers these in detail; and, by the employment of scientific methods, disposes of the several errors, we trust, for good.

Throughout the three volumes published, also, he has been able to furnish us with first-hand life-histories of all his subjects, thanks in large measure to the diligence and skill of Dr. T. A. Chapman and the other scientific entomologists who have collected so much useful material for him in each instance. There has been no necessity, therefore, to draw upon doubtful foreign authorities, or to repeat slavishly what experience proves so often to be entirely inaccurate and fanciful. Of the association of *Agriades thetis* (*bellargus*) and *A. coridon* (alas! for the "*y*") entomologists are continually reminded; of the offspring of cross-pairings we have indubitable examples. Yet how close the association actually is we have never realized so completely as after a perusal of the pages devoted by Mr. Tutt to the "Clifden Blue." With *Cyaniris semiargus* (we have long since dropped the improper "*acis*," no doubt because the "Mazarine Blue" can no more be accounted British!), the four species mentioned complete this particular instalment of Mr. Tutt's work, and it may be said truly, therefore, that it represents quality as well as quantity. We may venture to suggest, however, that as there is to be an Entomological Congress in August at Brussels, Mr. Tutt should take the opportunity to impress upon his brother lepidopterists abroad their nomenclatorial shortcomings, and the desirability of some sort of fixity. As it is, we owe him a debt of gratitude for helping to unknit an extremely "ravelled skein"; while at the same time descanting on the British butterflies in something better than the pedantic spirit of the book-naturalist.

The fifty-eight black-and-white plates, moreover, are not entirely devoted to the very important but highly specialized subjects of the microscope. Mr. F. Noad Clark, Mr. A. E. Tonge, and Mr. Hugh Main excel as exponents of the art of photo-micrography, but to the average reader their studies of the "blues" and their surroundings, of their larvæ and pupæ—many of them now authentically illustrated for the first time, in the earlier stages—will commend themselves even more than the highly technical biological details. We are glad to observe, further, that Mr. Tutt is not content merely to catalogue and describe the multifarious aberrations of the larger Lycænids. Where possible, he adds a figure which leaves us in no doubt as to the accuracy of the letterpress—a test which cannot always be applied to other writers. Thus it will be seen that Volume iii. of the British butterflies is an altogether worthy successor to those already published, and it is to be hoped, therefore, that liberal support will be forthcoming to continue the series, both in the form of an increased subscription list and of extended co-operation by entomologists who have acquired material that may assist the solution of the many problems which arise when any species, however common, comes to be examined by other than the casual methods of the "mere collector."

(H. R.-B.)

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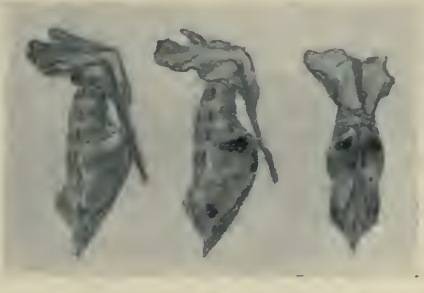
A BLACK-TIPPED ABERRATION OF *GONEPTERYX* (*RHODOCERA*) *RHAMNI*, MALE.

BY T. REUSS.



1 2 3

ON June 6th last, two fine larvæ of *Rhodocera rhamni* pupated in a heated breeding cage. One of the two pupæ, which hung side by side, emerged on the 15th as a large male specimen with unusually elongated and pointed wing-tips. The other pupa had already on the 14th attracted my attention by "colouring up" in an unusual way, as shown in the first of the above figures. While the wing-cases grew opaque with the bright yellow pigment deposited beneath them in the normal way, the tips of the wings remained transparent in the same way as do the wing-tips in pupæ of *Pieris brassicæ* and other species when the colouring begins to show itself. The pupa did not emerge on the 15th but continued to develop. The wing-tips began to grow greyish and opaque—on the 16th they were nearly black and by the evening they were jet black as in figs. 2 and 3. Also the wing-bases turned black, though hardly more than normal, and the discal spot remained orange. Early on the morning of the 17th, the pupa which, except for the black wing-tips, looked quite normal and promised a fine specimen, emerged unexpectedly as a cripple. Compared with aberrations of other species, the black-tipped *R. rhamni* (ab. *nigriapicata* n. ab.) would perhaps rank in the category with forms which have been described of

Colias hyale, *Anthocharis belia*, and others in which the fore wings from the discal cell to the apex had changed to black. But these species are normally already marked with black, while in *R. rhamni* the black apical coloration marks a new departure in development.

ON THE OVIPOSITION AND INCUBATION OF THE ICHNEUMONID *PANISCUS* (*PARABATUS*) *VIRGATUS*, Fourc.

By Rupert Stenton, F.E.S.

I believe it is generally thought that when a female ichneumon meets with a lepidopterous caterpillar fulfilling the necessary qualifications to serve as a pabulum for its own larva, the fate of that caterpillar is irrevocably sealed. Though this may be true as a rule, it is by no means invariably the case when the parasite is the above species and its intended victim *Cheimatobia boreata*, for the latter can and does fairly often come off victorious in the encounter.

In the first place, this caterpillar's habit of spinning together leaves and living between them is its best possible protection against an external parasite such as *P. virgatus*, which places its ova on and not in its host, having no long ovipositor wherewith to reach it in its habitation, and so evidently dependent on coming across it in the open. It was on supplying captive *virgatus* females on May 26th and onwards with *boreata* larvæ that I was able to witness the caterpillar's method of defence when attacked away from its abode; and on its tenacity in the battle which then takes place depends with which shall lie the victory.

It is the ichneumon's endeavour to place the egg as near as possible behind the head of its host, no doubt to prevent removal, which I found could sometimes be done if put too far towards the anal end. In this direction it faces after pouncing upon the caterpllar, who almost invariably then seizes one of its enemy's posterior legs; this is its main defence, but it will also lash itself to and fro and turn on its back, the parasite gripping tightly hold with its mandibles. To obtain sufficient force to drive in the ovipositor, or in a case like this merely to expel the egg, I have noticed that a female ichneumon exerts a strong upward pull, particularly with the powerful posterior legs, corresponding to the force it is necessary to put into the downward pressure of the abdomen, and so by holding one leg the caterpillar destroys the even balance of power, and renders the parasite utterly incapable of ovipositing. The matter is thus reduced to one of endurance, and should the caterpillar prove to possess the greater share of this, the ichneumon will not again interfere for a long time; not at all, I suspect, in a state of nature, as they would go their separate ways.

That this seizing of the enemy by the leg is a strongly instinctive action I should think probable, from having seen a larva of *Hybernia defoliaria* do it every time a species of *Anomalon* I kept in the same box with it approached, though without any sinister intent on the parasite's part.

The ovum itself of *P. virgatus* is long, black, and shining, somewhat rounded at one end, and very pointed at the other, and is attached to the host at this pointed end by a fine foot-stalk. In this light red, semi-transparent parasite, the ova can be seen lying as a dark mass towards the apex of the abdomen; on dissecting a captured female I counted thirty-seven, but this may not represent the full batch, as it is likely some might have already been deposited. Those nearest to the apex and ready for ejection were quite dark, but higher up they were whitish, beginning to turn black at the blunt end, and higher still they were quite light.

Oviposition takes place upon *boreata* larvæ usually from one to two days before they are about to commence pupation, the ova hatching when they have spun their cocoon; until this time the egg has remained in a more or less perpendicular position, but the young grub, partly emerging from the rounded end, causes a top-heaviness, which bends over the foot-stalk, allowing the parasite's mouth to come in contact with its food. It does not emerge entirely from the egg-shell for some time, but continues to feed, growing rapidly, until the shell is merely attached to the apical segment. By this time death has overtaken the caterpillar, and the parasite, which has hitherto been lying round its neck, now alters its position, withdraws its last segment from the shell, and lies alongside its victim in the cocoon, continuing to feed on its body.

The length of incubation varies according to the state of advancement of the host towards pupation, the time of hatching being when the *Cheimatobia* has spun its cocoon, and before it has assumed the pupal state. Normally, as before mentioned, the ova are deposited shortly preceding the host's retirement to its cocoon; should they almost immediately do this, I found the ova would hatch on the morning of the third day after parasitization.

That the desire of the host for pupation does influence the parasite within the egg, and that it can and does await the psychological moment when to emerge is evident, as by substituting *Hybernia defoliaria* larvæ, not nearly full-fed, for those of *Cheimatobia boreata*, and thus compelling *Paniscus virgatus*, who were anxious to be rid of their ova, to reluctantly oviposit upon them, I found that the length of incubation could be extended to fourteen days, and on the *defoliaria* showing a disposition to pupate, the ova duly hatched. Between the minimum length of time mentioned above and this maximum I found various degrees with *C. boreata*, *C. brumata*—which they would almost as freely parasitize—and *Oporabia dilutata*; though in one instance one of the last-named did manage to safely pupate, casting off the ova with the larval skin. The reason for the variability in the times of incubation is thus easily understood; but I have been unable to determine the cause which enables the embryo to await and choose with precision the correct time to split the shell.

P. virgatus females do not seem able to retain their ova for any length of time in the absence of a host; if deprived of the latter the ova are excreted, and cleaned off the apex of the abdomen with the posterior legs. I do not think, when at large, more than one egg at a time is deposited on a single caterpillar, and once only did one of my captives place two on a *boreata* without moving, though if a fresh supply of larvæ is not kept up they will continue to deposit ova at intervals on those already parasitized. One larva I had left for some time in a box with a female parasite had nine attached to its skin.

I have been unable to dip further into the economy of this interesting species owing to lack of material, the opening of a cocoon invariably occasioning the death of the parasite, partly, no doubt, owing to the drying up of its food, and with continual observations my stock has now almost reached the vanishing point.

[Mr. Stenton brings forward many interesting and novel points in the economy of this species, for which compare Newport (Trans. Linn. Soc. xxi. pp. 71–77, pl. viii. figg. 13–19); Westwood (Introd. ii. 145–7, figg. 76, 7–15); Adler (Ent. Nachr. v. p. 205); and Poulton (Trans. Ent. Soc. 1886, pp. 162–168 et 1888, p. 588). The first remarks that the larvæ "in the earlier stages of growth more resemble cotyledonous vegetables than animal organisms," and regards them as the representatives among insects of the prematurely liberated fœtus of the kangaroo. None of Mr. Stenton's three hosts has previously been noted for this species, his examples of which I have examined.—Claude Morley.]

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 163.)

[The following portion of this paper was in print before Dr. Chapman's explanation appeared in the July number of the 'Entomologist,' and I should be very sorry if either he or any other reader of the magazine should wrongly suppose that it had been written, as might appear, as an implied refusal to accept that explanation. At the same time, I adhere to the general principles which I have expressed; and with regard to the particular case in point, Dr. Chapman must indeed be hard to convince if he does not consider the evidence sufficient for the double-broodedness of what I must continue to call *britomartis* at Reazzino. Nothing could be more misleading (unintentionally, I am sure) than the statement that I "took it in June and in July in different seasons, and considered the June season a late one, and that these were the first and second broods," especially with the implication that this was my sole reason. This might mean that I took it one year at the end of June and another year at the beginning of July, and considered *that* sufficient evidence of the insect being double-brooded! a madly rash conclusion, even though my entries of dates with regard to other insects show that the season *was* a late one. The facts, however, are very different. I first found this *Melitæa* at Reazzino on July 25th, 1904, in fair numbers on ground which I had hunted thoroughly on the 22nd without seeing a single specimen of this insect, though there was no lack of others. This would imply that in all probability the species, all the specimens of which were very fresh, had come out between the 22nd and the 25th. I had no opportunity of visiting the same ground till July, 1906, when *britomartis* did not become really common till the 24th, though both sexes were taken the previous day, and one or two males as much as nine days before. So far I had no idea of its being double-brooded, but finding myself at Reazzino at the end of June, 1907, I unexpectedly came across a few worn specimens of a *Melitæa*, the under side of which showed at once that it was the same species, whilst the condition and date combined, when compared with the late July specimens of 1904 and 1906, made it obvious that they could not belong to the same brood. But this is by no means all. The two broods, though so much alike on the under side, differ greatly in the appearance of the upper side, especially in the males; whilst in the matter of size the very great difference has already been remarked upon ('Entomologist,' xli. pp. 181, 269). Indeed, with the exception of one or two unusually large females of the second brood, it would be impossible to mistake the specimens of one brood for those of the other. I should add that the specimens taken in June last year by Mr. Lowe on the same ground were like those I took at the same time in 1907, and, like mine, were by no means freshly emerged. I think also that Dr. Chapman has overlooked the fact that all the June females which I kept for ova proved to have already laid their eggs, whilst I was able to obtain eggs by dissection from the July females, which died without laying, probably through my ignorance of their food-plant. I still cannot help thinking that this evidence for the double-broodedness of this *Melitæa* is, as I previously called it, not merely sufficient but overwhelming.

I certainly used the expressions to which Dr. Chapman refers with regard to the palpi and antennæ quite intentionally, and can only express surprise at his regarding them as identical in this insect and *dictynna*. But this is nothing to the surprise I felt at the opinion attributed to me, as taken from my reported observations to the Entomological Society on March 4th, 1908, which opinion I was at once certain that I had never expressed, because it was one which I never held, *viz.* that "the close affinity with *M. dictynna* made separation superficially very difficult, and until all forms were reared from the ovum it would be impossible to determine whether *britomartis* constituted a separate species or not." I observe that Dr. Chapman guards himself by saying that I am "reported as saying" so, but on looking up the reference, I see that even this is hardly the case; no quotation marks are used, and it may quite well merely represent the impression left on the mind of the secretary. I am well aware that I am to blame in the matter, as I never supplied the secretary with notes as to what I did say, but I cannot too forcibly repeat that this is an opinion which I never for a moment held, though I consider it very important that all forms should be bred from the ovum. What my real views on the matter are is set forth in the following paragraphs.]

It would seem to be the peculiar snare of the specialist, or at least of those who have made a long and detailed study of any one organ, that they are apt to magnify the importance of the special object of their study, and to regard it as the standard by which everything is to be measured, to the exclusion of other structures which may in numerous instances be of greater significance. One of the most unfortunate consequences of this tendency of human nature is that those who have not specialized in the same direction are apt to lose sight of the real value which often underlies exaggerated claims, just as one instinctively (and often quite wrongly) rejects for all purposes the patent remedies which profess to effect universal cures. Yet it would probably be impossible to make a careful and detailed study of *any* organ without discovering facts which were of some biological value, or which were in some cases of use for purposes of classification, and with regard to the genital armature this is peculiarly the case. But, as with all other structures, the knowledge acquired on this subject cannot stand alone, and it will often rather afford hints as to the directions in which further search should be made, than supply students with the means of delivering infallible judgments on questions of phylogeny or classification. Although it is always possible that similarity of structure may be reached along different lines of evolution, yet this will always be the exception and not the rule, so that similarity in these structures will always be *primâ facie* evidence for close relationship, and identity will be still stronger evidence in the same direction, and, unless contradicted by other facts, will argue strongly in favour of identity of species; but before such identity can be assumed, other circumstances must be taken into consideration, or wrong conclusions are likely to be reached.

Now it so happens that in this comparatively small group two cases occur which illustrate this fact somewhat remarkably;

these cases are *britomartis* and *dictynnoides*. If we trusted to the genitalia alone, we should consider the former (as represented by the Reazzino specimens) to be cospecific with *dictynna* and the latter with *aurelia*. I state this on the authority of Dr. Chapman, and on this matter I believe there is no higher. Now it appears to me unthinkable that any person acquainted with this group could see an upper side series of the Reazzino *Melitæa* side by side with a similarly set series of *dictynna*, and suppose on that evidence that they were the same species, or even believe it without indisputable proof; the same thing being equally true with regard to *dictynnoides* and *aurelia*. If only first brood specimens of *britomartis* were available (the second brood being much more distinctive), it would not be surprising if they were taken for *athalia*, and *dictynnoides* on the upper side might equally well in many cases be taken for *dictynna*, though the under side, especially in the case of *britomartis*, tends more to support the evidence of the genitalia. Now, if this evidence were final and conclusive, as some specialists would seemingly have us believe, we should be compelled to distrust the evidence of the wing-markings, size, shape, &c. (which, in default of any other facts, we should probably be justified in doing), and to regard the one as a variety of *dictynna*, and the other as a variety of *aurelia*. Indeed, we should probably go one step further, and speak of them as "local races" of these insects. But here facts would at once contradict us. At Reazzino there is a single brood of *dictynna*, which is also single-brooded everywhere else, and this single brood comes out, as we should expect, between the two broods of *britomartis* on the same ground. In the same way, both on Mt. Cecina, where Hormuzaki originally discovered *dictynnoides*, and on the Tatra, where Mr. Sheldon took it last year, specimens of *aurelia* indistinguishable from Swiss or South German examples are also taken, and though both insects are in this case single-brooded, the time of emergence is not identical for the two. In both these cases these facts appear to me to amount to an overwhelming proof that, the evidence of the genitalia notwithstanding, *britomartis*, as represented by the Reazzino specimens, is *not* a form of *dictynna*, nor *dictynnoides* of *aurelia*.

Unfortunately, neither of the two species under discussion has so far been bred *ab ovo*, but even if the earlier stages should be indistinguishable from those of *dictynna* and *aurelia* respectively, that fact would not seem to me, in this group, the larvæ of which are so similar, to outweigh the evidence already adduced for their specific distinctness, while if the earlier stages differed at all materially from those of their nearest relatives, the question would of course be settled to the satisfaction of everyone that they are good species. The only scrap of evidence on this part of the subject which I have been able to acquire points, so far as it goes, in this latter direction. I cannot induce the female of the Reazzino *Melitæa* to lay on any of the usual food-plants of this group, though others of the group lay freely in captivity, which may point to some specialization in the matter of food-plant, or may have no significance whatever. These latter remarks apply only to the Reazzino insect, for Assmann has given a brief description of the larva of *britomartis* from Klarenkrantz, which, if trustworthy, is sufficiently distinctive, though in some points it approaches more closely to *dictynna*, and in others to *parthenie* or *aurelia*.

I must not, however, be taken to suppose that the anatomical evidence is in these cases of no importance, merely because I believe that a wrong deduction has been drawn from the facts; on the contrary, I believe that they give a valuable indication of the phylogeny of the species in question, and in the absence, so far, of any evidence compelling us to believe the contrary, we may at present assume that the connection between *britomartis* and *dictynna* on the one hand, and *dictynnoides* and *aurelia* on the other, is much closer than the double-brooded habit of the first-named species and the general appearance of each pair of species would lead us to suppose. The scarcity of *dictynna* at Reazzino and of *aurelia* on the Cecina and Tatra gives some slight support to the same theory, since it is well recognized that the struggle for existence is most severe between the most closely related species.

(To be continued.)

SOME BEES OF THE GENUS *CROCISA* FROM ASIA AND AUSTRALIA.

By T. D. A. Cockerell.

The beautiful parasitic bees of the genus *Crocisa* abound in the tropics of the Old World, and extend in diminished numbers into the warm temperate regions north and south. Their study has been considered difficult, owing to the supposed wide range and great variability of many of the species. Having paid some attention to the genus for a number of years, I am convinced that the species are more numerous and restricted in range than has been generally supposed. The identification of the described forms is not altogether easy, owing to the brevity of most of the descriptions; in some cases, when I have not seen material from the type locality or its vicinity, I may have erred in my determinations, being obliged to suppose identity when there is substantial agreement with the descriptions, and nothing is known to the contrary.

The material on which this paper is based is all in the British Museum; it may be tabulated as follows:—

First three abdominal segments each with four widely separated white spots; first segment also with a basal spot . . . . *C. albopicta*, Ckll.
Abdomen not thus ornamented, but more or less banded . . . . 1.
1. Markings strongly metallic; wings very dark . . 2.
Markings not or hardly metallic . . . . . 3.
2. Abdominal markings violet; first segment with a broad continuous, or almost continuous, basal band *C. quartinæ*, Gribodo, var. a.
Abdominal markings blue; first segment with only lateral marks . . . . . . *C. verticalis*, Ckll.
3. First abdominal segment practically covered with blue hair . . . . *C. basalis*, Friese.
First segment showing at least a large patch of black 4.
4. Scutellum with a pair of blue spots; abdomen with narrow bands . . . . 5.
Scutellum not or not clearly spotted; abdominal bands broad, or widely interrupted . . . . . . 6.
5. Apical and basal bands of first abdominal segment united laterally . . . . . . *C. rostrata*, Friese.
Apical and basal bands not united laterally *C. japonica*, Friese.
6. Basal band of abdomen complete or with a linear interruption . . . . 7.
Basal band of abdomen widely interrupted, or if not so, the median part hidden by scutellum . . . 8.
7. Anterior margin of pleura entirely covered with light hair . . . . *C. ridleyi*, Ckll.
Anterior margin of pleura dark in middle . *C. decora*, Smith.
8. Abdominal bands bright azure blue, wings very dark (Philippine Islands) . . . . *C. luzonensis*, Ckll.
Abdominal bands pale . . . . 9.
9. First abdominal segment with about middle third and hind margin dark . . . . . . *C. irisana*, Ckll.
First abdominal segment broadly dark . . . 10.
10. Pleura with lower half black-haired . *C. amboinensis*, Rads.
Pleura with the lower part pale-haired . *C. massurii*, Rads.

Crocisa albopicta, sp. nov.

♀. Length about 12 mm., expanse $24\frac{1}{2}$; intense black, with white spots; scutellum W-shaped, but the median angle much greater than a right angle; wings dark fuscous, with the usual hyaline spots; mesothorax 9-spotted, the anterior lateral spots mainly on prothorax, the median anterior line short, four discal spots forming the corners of a quadrangle, and a small spot above each tegula anteriorly scutellum unspotted, the hair projecting from under its hind margin black, except a little white in the middle; pleura with a broad zigzag transverse white band, and two spots below; sides of metathorax with a patch of white hair; tegulæ black, with a patch of white hair posteriorly; anterior tibia and basitarsus each with a large white patch on outer side, and long black hairs; middle femur with a pair of almost or quite contiguous white spots behind beyond the middle; hind femur with a large triangular white patch above at apex; middle tibia with a very large white patch on outer side; hind tibia with a smaller, subtriangular, median patch; hind basitarsus white on outer side except the basal fourth; anterior and middle basitarsi with a little white hair on outer side; abdomen with more or less round, widely separated, white spots, one at middle of base of first segment, four subapical on segments one to three, and two each on segments four and five; second and third ventral segments with a white spot on each side. In my table i. Bull. Amer. Mus. Nat. Hist. xxiii. p. 232, this runs out because of the different ornamentation of the tibiæ. Compared with *C. macleayi*, Ckll., it differs by the white spots not being stained with ferruginous, the ornamentation of pleura, the anterior wings dark practically to base, &c. The ornamentation of the face is rather peculiar, consisting of a large thick U in white (leaving the lower half of the clypeus dark), and small geminate white spots below the antennæ.

Hab. Mackay, Queensland (Turner, 450).

Crocisa ridleyi, sp. nov.

♀. Length about 12½ mm.; black with bluish-white markings, on face quite white, but on abdomen, legs, &c., a very delicate pale bluish; scutellum W-like, but the median angle much greater than a right angle; anterior wings dark fuscous, with the usual spots, the basal region largely hyaline, but the fuscous extending strongly along the basal nervure and the region of the transverso-medial, but a sharply defined hyaline line along the upper side of the anal nervure, the anal cell also mainly hyaline; posterior wings hyaline, slightly brownish; pygidial plate with a very sharp median carina; clypeus densely punctured; face covered with white hair, scanty on upper part, and wanting on lower third of clypeus; mesothorax with a light margin, broken (abraded ?) behind; median mesothoracic stripe broad, narrowing posteriorly, ending about middle of disc, with a spot on each side; scutellum sparsely punctured, black, much white hair coming from beneath the notch; pleura light-haired, with a large central very strongly punctured bare patch; anterior and middle femora with light hair behind; tibiæ light-haired on outer side, anterior ones with a shining apical bare spot, hind ones with about the apical third black-haired; tarsi light-haired on outer side, even on the small joints; abdomen obscurely metallic, especially on first segment; first segment with broad basal and subapical bands, interrupted medially, the two joined by a vertical band on lateral margins; the other segments with broadly interrupted bands, that on the second having a lateral process extending to base of segment; ventral segments two to four with much light hair at sides.

Resembles *C. decora*, but known by the paler markings, the posterior band of first segment only rather narrowly interrupted, the light margin of mesothorax continuous laterally, &c.

The pattern of the abdomen is nearly as in the African *C. braunsiana*, Friese.

Hab. Penang (H. N. Ridley).

Crocisa irisana, sp. nov.

♀. Length about 10 mm., expanse about 21; black, the colour of the markings as in *C. ridleyi*; scutellum W-like, but the median angle very broad; wings brownish, only moderately dark, the colour nearly uniform on anterior pair; pygidial plate small; clypeus very minutely punctured; a strong keel between antennæ; face covered with light hair, but most of clypeus bare; mesothorax with six large spots, the anterior ones largest, transverse, about half on prothorax; median line reduced to a small inconspicuous isolated longitudinally elongated spot; a small patch above each tegula, the tegulæ minutely punctured, and with a white patch behind; scutellum dark, with some bluish-white hair above the notch, and long white hair (not at all bluish) projecting from beneath; pleura white-haired (very densely above), with a very broad transverse strongly punctured black band; anterior and middle femora with some white hair at apex behind; tibiæ and tarsi marked practically as in *C. ridleyi*; abdomen marked essentially as in *C. ridleyi*, except that the first segment is all light-haired at sides, except along hind margin, the light area notched on each side within.

Hab. Irisan, Benquet Province, Philippine Islands, May 1st. Collector unknown to me. *C. emarginata*, *C. lamprosoma*, and *C. nitidula* have been listed from the Philippine Islands, but their presence there needs confirmation.

The following species have been previously described:—

C. quartinæ, Gribodo, var. a. Markings of abdomen violet. Koepang, Timor. No. 483.

C. verticalis, Ckll. Amboyna.

C. basalis, Friese. Semao Island (off Timor). No. 430.

C. rostrata, Friese. Singapore (H. N. Ridley).

C. japonica, Friese. Japan.

C. decora, Smith. Singapore (H. N. Ridley); Tjigombong, Java (C. W. Andrews); Sadia (= I suppose Sadiya in Assam). This is *C. emarginata* of authors, but not the true *emarginata* of Lepeletier. Bingham ('Fasciculi Malayenses,' Zool., iii. p. 56) refers what I suppose to be the same insect to *C. decora*, and I follow him, not without recognizing a possibility that the true (Chinese) *decora* is different. The abdominal markings are of a fine turquoise blue, of the same colour as those of *C. basalis*.

C. luzonensis, Ckll. Irisan, Philippine Islands, May 30th. Evidently obtained by the same collector as that of *C. irisana*. The blue of first abdominal segment is deeply squarely incised basally, and there are four broad entire bands.

C. amboinensis, Rads. Amboyna.

C. massurii, Rads. Dalhousie, N.W. India, July 7th, 1906

(H. J. W. Barrow); Kangra Valley, 4500 ft., October, 1899 (Dudgeon). The Kangra Valley specimen has the abdominal bands much more widely interrupted than the other, but it is of the opposite (female) sex.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 193.)

Syntomoides catena, sp. n.

♀. Head and body blackish, a yellow patch on prothorax, and traces of a yellow belt on middle segment of the abdomen. Fore wings blackish, hyaline spots somewhat as in *S. finitima*, but smaller, and the outer series more uniform and chain-like. Hind wings have three hyaline spots, one below the cell, and two, separated by a vein, beyond end of cell.

Expanse, 22 millim.

Collection number, 20.

Two specimens from Garambi, October, 1904.

Possibly this may be the female sex of *S. finitima*.

Syntomoides finitima, sp. n.

♂. Head and thorax blackish, the latter marked with yellow; abdomen blackish, dorsally marked with yellow, and laterally with yellowish orange. Fore wings blackish with seven hyaline spots, separated by the veins and placed as follows: one in the cell, a smaller one below, a larger one in the interno-median interspace; a series of four beyond end of cell, the second minute. Hind wings have the central area hyaline, broken up by the blackish veins; margins broadly blackish.

Expanse, 22 millim.

Collection number, 20 *a*.

Two male specimens from Kanshirei (1000 ft.); one taken April 16th, 1906, the other (the type), July 21st, 1908. The 1906 example expands 25 millim., and the hyaline spots are larger than those of the type.

Syntomis interrupta, sp. n.

Head black, face yellow, antennæ black tipped with white above; thorax black, collar, patagia, and posterior edge yellow; abdomen black with seven yellow belts, the first incomplete, and the last three confluent above. Fore wings black; five hyaline spots—one near the base yellow tinged, a triangular one in the cell, one divided by vein two below the cell, two beyond the cell each traversed by a vein (the basal spot is separated from the spot below cell by a square patch of the ground colour, and both these spots are only divided from that in the cell by the median vein). Hind wings hyaline with some yellow scales on inner margin; the rather broad black border projects inwards about middle.

Expanse, 37 millim.

Collection number, 24.

A male specimen from Garambi, November 5th, 1904.

Syntomis lucerna, sp. n.

♂. Head black, face pale ochreous; thorax black spotted with yellow; abdomen black with eight yellow belts, the first and last incomplete. Fore wings black, some yellowish scales at base; five hyaline spots—a triangular one near the base, one in the cell and one below, two beyond the cell, each divided by a vein. Hind wings hyaline with rather broad costal and outer marginal borders, the latter projected inwards about the middle; the inner margin edged with black and tinged with yellow at anal angle. Under side similar to above, but the fore wings have whitish apical spots.

♀. Agrees with the male, but the hyaline spots are somewhat larger; there are only seven yellow belts on abdomen, the first and last incomplete, and the latter broad.

Expanse, ♂ 46 millim., ♀ 44 millim.

Collection number, 24 *a*.

A pair from Kanshirei (3200 ft.), May 9th, 1908.

Syntomis lucerna flava, subsp. nov.

Except that the hyaline spots and the hind wing are more or less covered with yellow scales this is almost identical with the type. It is, however, rather smaller, the eighth ring of abdomen is represented by a small yellow spot, and the apical spot is absent on the under side of the fore wings.

Expanse, 40 millim.

Collection number, 24 *b*.

One male specimen from Banshoryo, September 15th, 1908.

Ilema arizana, sp. n.

♂. Fore wings pale whitey-brown, with a faint grey tinge in certain lights; costa towards apex ochreous tinted. Hind wings paler and slightly tinged with yellow. Under side of fore wings suffused with fuscous, costa narrowly ochreous.

♀. Fore wings paler than in the male; hind wings whiter.

Expanse, ♂ 38 millim., ♀ 40 millim.

Collection number, 753.

One example of each sex from Arizan (7300 ft.), September, 1906.

Allied to *I. deplana*, Esp.

Ilema tecta, sp. n.

Head and thorax pale ochreous grey, abdomen whitish grey, posterior segments and anal tuft ochreous. Fore wings whitish, rather silky, costa yellowish tinged, inner margins suffused with dusky. Hind wings whitish, slightly tinged with ochreous grey. Under side of fore wings dark grey, almost black; a pale streak above the cell from near base to beyond middle of costa, thence along the costa itself to apex.

Expanse, 35 millim.

Collection number, 753 *b*.

One male specimen from Rantaizan (7500 ft.), May 8th, 1909.

Allied to *I. varana*, Moore, from Sikkim.

Ilema taiwana, sp. n.

Head and collar orange, thorax blackish grey; abdomen grey, terminal segments tinged with orange. Fore wings narrow, blackish grey, costal stripe orange, terminating in a point at apex; fringes tinged with orange. Hind wings pale whitey brown, costal area suffused with fuscous.

Expanse, 34 millim.

Collection number, 72 *b*.

One male specimen from Rantaizan (7500 ft.), May 9th, 1909.

In some respects this species resembles *Lithosia japonica*, Leech, but the fore wings are narrower, the costal stripe is deeper in colour, and extends to the apex.

Asura striata, sp. n.

♂. Head and thorax pale salmon-pink, the latter black dotted. Fore wings pale salmon-pink; antemedial band black, its outer edge nearly straight, its inner edge diffuse towards costa, and an inward projection about middle; a postmedial series of black streaks on the veins, the inner ends of the upper streaks connected by a short, irregular, transverse line, which represents the postmedial; black dots on the outer margin. Hind wings paler.

Expanse, 21 millim.

Collection number, 76 *a*.

One male from Kanshirei (1000 ft.), November 7th, 1908.

Eugoa grisea ab. *suffusa*.

Fore wings rather more violet tinted, and dark sprinkled; the dots on postmedial line are more directly one over the other, and the area beyond the line is much suffused.

Collection number, 696.

One male specimen from Rantaizan (7500 ft.), May 14th, 1909, and two males from Kanshirei (1000 ft.), April 18th, 1908.

Nola (?) *tripuncta*, sp. n.

♂. Head and thorax white, abdomen whitish. Fore wings white, sparingly flecked with fuscous indicating irregular transverse lines; three black dots on the costa, the middle one largest and triangular in shape; a linear blackish mark at end of the cell. Hind wings whitish, tinged with fuscous. Under side of fore wings blackish, except on the margins.

Expanse, 22 millim.

Collection number, 1275.

One male specimen from Arizan (7300 ft.), August 18th, 1908.

Miltochrista convexa, sp. n.

Fore wings orange-red, costa and fringes black; basal dot and streak black; three black transverse lines, the first and third excurved; the second incurved, touching (or approximating) the third at each extremity, and united with the first above the middle; beyond the third line is a series of eight black streaks on the veins, the third and fifth longer than the others and touching the line; a black dot in the cell. Hind wings paler; fringes, and cloud on outer margin towards costa, blackish. Under side as above, but the markings are blurred.

Expanse, ♂ 23 millim., ♀ 28 millim.

Collection number, 762.

One example of each sex from Kanshirei (1000 ft.); the male captured in April, 1906, and the female in August, 1905.

Near *M. exclusa*, Butl.

Miltochrista connexa, sp. n.

Differs from *M. convexa* in having the first and third transverse lines obtusely angled below costa, and the third is also sharply angled before its termination on the inner margin; the black streaks on the outer area start from the third line, and the third and fifth of these streaks are continued inwards to a black dot in the cell. On the under side of the fore wings the black streaks towards the costa are confluent, forming a blackish cloud.

Expanse, 24 millim.

Collection number, 762 *b*.

One male from Arizan (7300 ft.), August, 1908.

This may prove to be an aberration of *M. convexa*.

Miltochrista dentata, sp. n.

Head and thorax orange-red; abdomen blackish, anal tuft orange-red. Fore wings orange-red, costa and fringes black; antemedial line black, indented and angled under costa, thence inwardly oblique to the inner margin; postmedial line black, sharply dentate, followed by a series of black dots; medial line black, almost straight. Hind wings crimson-red, blackish clouds on outer margin; fringes black. Under side similar to above in colour, but the fore wings have a black spot with dot below it towards apex, and the transverse lines are absent.

Expanse, 19 millim.

Collection number, 761.

One female specimen from Arizan (7300 ft.), September 19th, 1906.

(To be continued.)

DESCRIPTIONS OF THE LARVA OF *MELANITIS LEDA*, AND OF THE LARVA AND THE PUPA OF *PAMPHILA MOHOPAANI*.

By Herbert A. Green, F.E.S.

Melanitis leda.

Larva. Ground colour yellow, a median dorsal green stripe and some narrower ones on each side from head to tail. The surface of the body is roughened. The head is the only variable feature in the numerous specimens I have had. In some cases this is entirely black except for two small white spots, one on either side of the head at the lower angle close to the mandibles; in others there is only a narrow black line from the base of the horns, or projections, down the side of the head to lower angle. In all cases there is a narrow white line immediately behind and touching black on the head. Horns black in front, reddish-brown behind, and covered with bristles. Caudal processes not as long as cephalic horns, very slightly divergent. Several have been "ichneumoned" by a common dipterous fly.

Pamphila mohopaani.

Larva. Pale green with two white lines, divided by an equal width of ground colour, dorsally narrowing gradually at head and tail until they disappear. Head black, with four whitish marks, two small at lower angle of head, two larger extending from crown to half way down head; these two spots are divided by a thin projection of the black. Length about two inches.

Pupa. The pupa is pale greenish white, the head prolonged to a point about an eighth of an inch in length. On the under side is a fine projection starting from the middle and extending nearly to tail. One curious feature about this pupa is that the white efflorescence is deposited on the leaf before pupation and not, as in *keithloa*, appearing after pupation on the pupa itself. Feeds on Bush Guinea Grass.

Durban (Natal).

NOTES AND OBSERVATIONS.

Ephemera producing Living Young.—It seems by the following extracts from well-known books that information with regard to the *first* stages of *Ephemera* is still wanting.

Leland O. Howard in 'The Insect Book' says of May-flies, "In *one* case a female has been seen to deposit living larvæ."

Dr. Sharp in the 'Cambridge Natural History,' vol. v., pages 432–3, speaking of the description given by Sir John Lubbock of the metamorphosis of *Cloëon*, says: "His observations were made on captured specimens, so that it is not certain that what he calls the first stage is really such." With regard to the eggs, Dr. Sharp says, on page 441, "The eggs are very numerous, and it is thought may sometimes remain in the water as much as six or seven months before they hatch."

In view of this want of information, perhaps an experience I had some years ago may be worth recording, although my ignorance at the time of its being anything worth special notice prevented my preserving any of the young in *the very first stages*, by mounting them as micro slides, or taking detailed notes of formation, which I much regret. I may mention that from 1871 I had been much interested in pond-life in Turkey—had several small aquaria always under observation, and as the larval forms of May-flies were to be found in every pond and ditch, I kept aquaria well-stocked with them as food for other forms of pond-life. Those most common agreed with what Wilson in 'Chapters on Evolution' called "*Cloe bioculata*," except that, in the figure given on page 266, the tail-hairs are shown all three-feathered on both sides: my Turkish larvæ had the middle hair feathered on both sides, but the other two only on the inside; the figure of *Cloëon dipterum*, given on page 432, vol. v. of 'Cambridge Natural History,' is *exactly* like the Turkish forms. I frequently had the flies (both male and female) emerge from my aquaria, so I knew them well by sight as *Cloe bioculata*. I find by my note-book that it was on September 27th, 1901, I caught a female May-fly (*Cloe bioculata*) on the glass of my window, by taking hold of her wings. She at once flicked her body round, and deposited a fairly large mass of something on my finger. Thinking it might be her eggs, I put a drop of water on it, and examined it with a pocket lens. To my great surprise I found it was a "squirming mass" of living young ones. I washed them off into a small aquarium, where they found plenty of food, as an hour later when I placed some in a small tank for examination under the microscope, I could see they had been eating freely. They had only *two* tail-hairs, no "gills," five dark spots on the head, two on each side near the top of the head, and one lower down in the centre of the head nearly over the mouth: this looked as if much deeper in the tissue of the head, the others seemed to be on the skin. The next day (28th), I caught another female, she did the same thing, but in this case only a small number were larvæ, the bulk of the mass being eggs; still, on putting some under the microscope, I could see they were on the point of hatching, and some did hatch while I had them under observation. I placed these in the same aquarium with the others. After about a week, in which no changes worth taking note of took place, pressure of business and absence from home prevented my making more observations until November 7th, when on examination of the aquarium I found plenty of the May-flies alive, and grown considerably. They had three tail-hairs and gills. I found a number of cast skins, and have reason to think that at least three moults had taken place since the centre tail-hair had developed, as I found skins with this hair of various lengths. Evidently, having come into the room, these flies were unable to find their way out again, and, unable to find water, retained their eggs until they hatched in the body, but the speed with which this happened hardly agrees with the idea that, if laid in water, they would have taken "six or seven months to hatch."

I shall be much obliged by information as to name. Are *Cloe bioculata* and *Cloëon dipterum* synonyms? I notice that Miall in his 'Natural History of Aquatic Insects' gives the name as *Chloeon dipterum*. When Doctors and Professors differ, where does the poor student come in? — William Harvey; Eastbourne, July 8th, 1910.

Parasites of Callophrys rubi.—In the July 'Entomologist,' Dr. Chapman, when recording the breeding of an ichneumon from this species, quotes Mr. Claude Morley as saying that it "is the first parasite ever bred from *Thecla rubi*, so far as I am aware." Mr. Morley was probably thinking of hymenopterous parasites only, as dipterous parasites have been recorded. Brauer and von Bergenstamm in the 'Zweiflügler des Kaiserl Museums zu Wien,' part vii., p. 72, give *Exorista confinis*, Fall, and *Exorista tritæniata*, Rond.; and Mr. Verrall has a specimen of the latter species, the laconic label of which reads—if I remember rightly—"ex *rubi* Barrett."—Colbran J. Wainwright; 45, Handsworth Wood Road, Birmingham.

British Scorpion-Flies.—I have paid but scant attention to this group of insects, but Mr. Lucas's note in the last number induces me to send you the following jottings from my collection, which is named by McLachlan and Morton. *Panorpa communis* occurs in Suffolk from May 21st, through June to July 5th (once on July 26th); it is abundant, but I have never seen it with prey, always sitting on bushes or swept from herbage at Bentley, Barnby, Assington, Southwold, Henstead, Lavenham, Stanstead, Barham, Woolpit and Monks Soham. Helpston Heath, near Peterborough, June 13th, 1908. On July 2nd, 1910, I saw one in my garden here, sucking blackberry flower and standing vertically in it; on August 8th, 1901, I took one sucking Angelica flower at Matley Bog, New Forest. *Panorpa germanica* occurs in Suffolk from May 11th to June 14th only (though once on August 24th); it is common, but I have never seen it with prey, always sitting on bushes or swept from herbage at Bentley, Bramford, Henstead and Assington. Helpston Heath, near Peterborough, June 13th, 1908; Knight Wood, New Forest, June 14th, 1907. *Panorpa cognata* is very rare, and I have but once met with it; two specimens were beaten from alder bushes in Barnby Broad, Suffolk, along with *P. communis*, on July 5th, 1906. Of *Boreus hyemalis*, I possess but a single female, given me some years ago by Mr. Albert Piffard, who took it at Felden, Boxmoor, Herts; it certainly does not occur about Ipswich, whence I have examined cartloads of moss and debris, and I should be surprised to learn that it is to be found at all in the Eastern Counties.—Claude Morley; Monks Soham.

CAPTURES AND FIELD REPORTS.

Notes on Lepidoptera in June.—I was able to pay a short visit to Wansford on June 1st, but saw nothing of *Carterocephalus palæmon* until I was about to return to the railway station, when one example, just emerged, allowed itself to be taken. I saw no others. I paid an afternoon visit to Chippenham Fen on the 15th inst., and was very pleased to see and take for the first time *Emmelia trabealis*, one individual only occurring at the roadside just beyond the green road leading to the fen. *Bankia argentula* occurred freely; *Hydrelia uncula* sparingly; small larvæ of *Cucullia verbasci* were on the *Scrophularia*, but my efforts to find either larvæ or pupæ of *Plusia chryson* were quite fruitless. During the greater part of June I was sugaring in Eye and found things rather backward and Lepidoptera far from common. *Hypsipetes ruberata* occurred sparingly on trunks of willows; *Phibalapteryx lignata* at rest after dark and at sugar. The fine dark fen form of *Sericoris lacunana* was occasionally netted. *Argyrolepia schreibersiana* was very scarce on trunks of black poplar, *Eupœcilia notulana* was not uncommon. *Baccalatrix boyerella* was not common on elm-trunks. *Elachista cerusella* was taken commonly, flying over ditches, and *Nepticula regiella* occurred among hawthorn. Larvæ of *Tæniocampa gracilis* appeared to be common in tops of *Spiræa*.—C. H. Whittle; 7, Marine Avenue, Southend, June 29th, 1910.

Coremia quadrifasciaria in Surrey.—On June 24th last, Mr. Norman Riley netted a male specimen of this species. It had been disturbed from a hedgerow by my beating-stick, so the captor very kindly gave it to me. In the Victoria History of Surrey (List of Lepidoptera, p. 126) *C. quadrifasciaria* is stated to be rare in the county, and the only localities mentioned are Gomshall, Guildford, and Whitley. To these may now be added—Byfleet (R. S., July 23rd, 1904), Oxshott (A. Scollick, August 17th, 1907), Aldershot (B. Tulloch, Entom. 1908, p. 274), and Ockham (as above). — Richard South; 96, Drakefield Road, Upper Tooting, S.W.

Note on Eupithecia assimilata.—In a previous note on this species (Entom. xlii. 261) I mentioned that, from larvæ collected from hop in the garden, one imago emerged on August 22nd, 1909. No other moth came up that year. One appeared on June 16th, two on June 20th, and one on June 24th this year. About May 3rd a moth that seemed to be *E. assimilata* was seen on the fence, but as capture was not effected, its identity was not established. A half-grown larva of the species was found on the under side of a hop leaf, quite close to the ground, on July 1st last; another, in last instar, on July 3rd; and a third, almost full grown, under a leaf of black currant, on July 17th. —Richard South.

Argynnis lathonia at Folkestone. — Messrs. Watkins and Doncaster tell me you will like to know that I captured a fine specimen of *Argynnis lathonia* (Queen of Spain Fritillary) at Folkestone Warren, on June 27th last.—D. Alroy Salamon; 86, Tower Hill, July 7th, 1910.

CAPTURES AT SUGAR IN YORKSHIRE.—On June 7th, 1902, I had the good fortune to take *Acronycta alni*, and on the same date this year another good specimen was secured. Two days later, June 9th, I again sugared in the same locality, and was successful in taking three more good specimens, one of them strongly inclined to melanism. I also took two *A. leporina* and missed another specimen of the same species. *Hadena thalassina*, *Euplexia lucipara*, *Xylophasia rurea*, and other common moths were very plentiful. I also took several melanic varieties of *A. psi* and *Agrotis segetum*. *Apamea unanimis* was also plentiful.—GEO. BUNCE; 1, Johnston Street, Wakefield, June 12th, 1910.

PACHYS (AMPHIDASYS) BETULARIA ab. DOUBLEDAYARIA IN ESSEX.—In the 'Entomologist' for July, 1910, p. 204, the Rev. W. Claxton announces the capture of a fine specimen of this form at Navestock, on May 21st, and suggests it may be a record for Essex, but he is nearer the mark when he further suggests that some of your readers may know better than himself. Several years ago I put out an ordinary bred female on an apple-tree in my garden, and was not a little surprised to find a black male paired with it the next morning. Since then I have found similar pairings on trees hereabouts, and have bred many fine black and intermediate forms. The specimens obtained from wild larvæ and pupæ collected here are far finer than any I have received from northern correspondents. In recent years there has been such a demand for these larvæ that I have had very few left. This spring I had only three and these produced one ordinary male and two large, intensely black females. This black form is so frequently turning up here now that it appears to be gradually superseding the light one. If I remember rightly, there is a record by Paymaster-in-Chief Mathew, R.N., of the occurrence of *doubledayaria* at Dovercourt, and I have an impression that it has occurred to some of my other Essex friends elsewhere in the county. One of my black females paired in my garden with an ordinary male this year, and I have now a good brood of the resulting larvæ feeding on *Salix viminalis*.—W. H. HARWOOD; 94, Station Road, Colchester, July 4th, 1910.

PACHYS BETULARIA var. DOUBLEDAYARIA (LEPIDOPTERA). — On May 31st last, in Kingston-on-Thames, I found on the pavement a large female of the Peppered Moth. It was quite alive, but had received a little damage. In greatest expanse from tip to tip of the fore wings it measured 60 millim.—W. J. LUCAS.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May* 12*th*.—Mr. A. Sich, F.E.S., Vice-President, in the chair.—Mr. Yonge exhibited a series of *Melitæa aurinia*, taken at Verney Junction about 1890, but apparently now it is extinct there.—Mr. Ashdown, a specimen of *Asphalia flavicornis*, from Mickleham, having a large dark blotch in the disc of the fore wings. — Mr.

Edwards, numerous species of the genus *Parnassius*, including *P. transiens*, *P. smintheus*, *P. gracilis*, *P. imperator*, &c. — Mr. Main, specimens of two species of scorpion, sent him from South France by Dr. Chapman.—Mr. Coulson, a very pale buff example of *Phigalia pedaria* from Epping Forest.—Mr. Hy. J. Turner, a number of species of Lepidoptera from Zermatt, and read a paper entitled "A Few Days with the Butterflies of Zermatt."

May 26*th*.—Mr. J. W. Kaye, F.E.S., President; in the chair.—Mr. Newman exhibited ova of *Sesia andræniformis* and two specimens of a blue butterfly, male and female, from the late Mr. Sabine's collection, supposed to be a natural hybrid between *Agriades corydon* and *A. thetis* (*bellargus*). — Mrs. Hemmings, a very fine gynandrous specimen of *Celastrina argiolus* taken in Surrey on March 10th, 1910. —Mr. Edwards, numerous species of the South American genus of Satyridæ *Taygetis*, and a number of under sides of *Melanitis leda*, showing extreme variation in colour and markings. — Mr. Adkin, the series of *Boarmia repandata* referred to in Proc. S. Lond. Ent. Soc. 1909, p. 3, and read further notes on them. He also reported an instance of a butterfly, *Pieris brassicæ* (?), being captured and carried off by a bird.—Mr. Step, a number of the carnivorous slug *Testacella haliotidea*, found by Mr. West in his garden at Ashtead. — Mr. Sich, the small winter tents of the hybernating larvæ of *Hyponomeuta cagnagellus*.—Dr. Hodgson, specimens of *C. argiolus* and *Pieris napi* recently bred or taken by him, as noteworthy in the colour investigations he has been carrying on for some years.

June 9*th*.—Mr. J. W. Kaye, F.E.S., President, in the chair.—Mr. Edwards exhibited a large number of species of American *Pierinæ*.—Captain Cardew, a short series of *Epione advenaria*, including a unicolorous specimen from Godalming.—Dr. Hodgson, the imagines bred from a brood of *Pieris napi* from ova laid in May, 1909. Some emerged in July–August, 1909, but most of the insects did not appear till the spring of 1910.—Mr. Harrison reported the assembling of twenty-one males of *Amphidasys betularia*, fourteen of which were var. *doubledayaria*, at Woodford.

June 23*rd*.—The President in the chair.—Mr. Ashdown exhibited a specimen of *Ægeria culiciformis* and the rare Coleopteron, *Anthraxia nitidula*, from the New Forest, in May.—Mr. Newman, a very long bred series of *Ematurga atomaria*, with a large proportion of melanic specimens.—Mr. West, specimens of Coleoptera and Hemiptera taken during the field-meeting at Ranmore on June 18th, including *Cryptocephalus coryli*, *C. moræi*, *Stiroma albomarginata* (developed forms), *Deltocephalus abdominalis*, &c.—Mr. Carr, a collection of Lepidoptera taken in the Wye Valley during July and August, 1909, including *Leucophasia sinapis*, *Grapta c-album*, a fine series of *Cidaria picata*, &c.—Mr. R. Adkin, a series of *Endromis versicolor* and *Biston hirtaria*, reared from ova sent him from Aviemore in 1908, and read notes on the emergences in 1909 and 1910. Several of the former species, and many of the latter, were apparently going over another year.—Mr. Sich, a beetle reared from a yellow silken cocoon found at Ranmore Common on *Hippocrepis comosa*.—Mr. Cowham, a *Nyssia zonaria*, mainly female, but having antennæ slightly pectinated, and unusually large wings. — Mr. Edwards, a number of large species of Coleoptera, among which were *Oxynopterus audauinii* (a gynandromorph) from N. Borneo, *Ceratorhina morgani*, and *C. quadrimaculata* from W. Africa.—Mr. J. W. Kaye, numerous aberrant specimens of *Polyommatus icarus*, varying in ground colour, with confluent spots, developed marginal spots, &c. —Mr. F. Noad Clark reported that *Æ. tipuliformis* had been common in his garden at Wembley, the females "assembling" about half-past one to two.—Hy. J. Turner, *Hon. Rep. Secretary*.

The Manchester Entomological Society.—*January 5th*, 1910. —Meetings held in the Manchester Museum, Owens College.— Election of officers for 1910: President, Mr. C. F. Johnson, F.E.S.; Vice President, Mr. W. P. Stocks, F.R.C.S.; Hon. Treasurer, Mr. W. Buckley; Hon. Librarian, Mr. B. H. Crabtree, F.E.S.; Hon. Secretary, Mr. A. W. Boyd; Council, the above, and Messrs. J. Ray Hardy, J. E. Cope, and A. E. Wright. Mr. J. Ray Hardy, Curator in Entomology to the University of Manchester, was elected an honorary member.—Mr. C. F. Johnson, F.E.S., gave the Annual Presidential Address:—"The Apparent Increase and Decrease of Certain Species of Lepidoptera during the last Fifty Years." Mr. Johnson took the works of Newman and Coleman as a basis, and showed in detail that many species had disappeared from old localities. He drew the conclusion that most of these cases were due to closer cultivation and the reclamation of land. In many cases, however, an adequate explanation seems to be impossible. On the other hand, he showed that a number of species (e. g., *P. moneta* and *C. ambigua*, &c.) have increased their numbers quite lately. Mr. Johnson expressed the hope that this interesting and important subject would receive greater attention in the future.—Mr. J. Watson made a most interesting exhibit of the newly described silk-moth, *Cricula andrei*. He explained that odd specimens had been bred previously from among the gregarious cocoons of *Cricula trifenestrata* from Assam, but were thought to be varieties of the latter. By selecting from a number of *C. trifenestrata* cocoons four or five which appeared to be slightly different, he had bred the moth, and two pairings had resulted in a fine series. *C. andrei* is of a rich crimson colour, while *C. trifenestrata* is a dull brown or buff. The larvæ, too (of which preserved examples were shown), are quite different. He also showed series of *Rhodia fugax* and *Caligula simla* and *japonica*, with fertile eggs of *fugax* and *japonica*.—Mr. A. E. Wright exhibited an example of *Luperina gueneei* var. *baxteri*, taken in the Fylde in 1909; and, for comparison, series of *Luperina testacea*, *Agrotis ripæ*, and *Aporophyla australis*.—Mr. J. E. R. Allen exhibited a fine aberration of *Abraxas grossulariata*, bred in 1908 from a wild Enniskillen larva. This was almost without black markings, having a few small spots only.—Mr. W. Buckley showed series of *Hybernia defoliaria* and *H. aurantiaria*, *Eupsilia satellitia*, *Orthosia rufina*, *Noctua dahlii*, and *Orthosia circellaris* (*ferruginea*), from near Stoke.

February 2nd, 1910.—Mr. Johnson, F.E.S., the President, in the chair.—The following exhibits were made:—Mr. R. Tait, Jr., long series of *Hybernia defoliaria* and *aurantiaria* taken in Delamere last November. The *defoliaria* showed great variation, and included a dark specimen with black markings on a dark brown ground. He also showed a series of *H. pennaria*, bred from Monkswood larvæ, and taken in Delamere.—Mr. A. W. Boyd, series of *H. defoliaria* and *aurantiaria* from Delamere and Borrowdale, *C. boreata* from Delamere, *Epunda lichenea* from Penmaemawr larvæ, *Orthosia rufina* from Delamere larvæ, and *Hadena contigua* from Borrowdale.—Mr. J. Watson, specimens and live cocoons of *Attacus edwardsi* from Assam, and several examples of a dipteron bred from a moribund larva found in a cocoon. He pointed out the difference between *A. edwardsi* and *A. atlas*. He also showed several specimens of a species of *Colias* taken in Southern Uganda, at a height of 11,000 ft. on Mount Ruwenzori. These were very near *C. electra* of the Cape, and resembled our *C. edusa* closely.—Mr. A. E. Salmon read a note on *N. typhæ*, describing how imagines had emerged, on June 2nd, from pupæ found four days previously at Ashley, Cheshire. In the same locality he observed half-grown larvæ on July 14th, and new pupæ on July 31st, from which imagines emerged on September 4th. This seems to point to two broods in the year.

March 2nd, 1910.—Mr. Johnson, F.E.S., the President, in the chair.—Mr. J. Watson read a paper on the Saturniidæ, or silk-bearing moths. After dealing with the nature of silk, he gave a detailed account of the various families and species of the Saturniidæ, referring particularly to *Antheræa mylitta* (Tussore silk) and *Antheræa pernyi* (Shantung silk), which are of great commercial importance in view of the possible failure of degenerate *Bombyx mori*. He illustrated his paper with long series of many species, a number of live cocoons of *Rhodia fugax*, *Samia gloveri*, *Antheræa mylitta*, *T. selene*, and others, showing the various methods of emergence, and live larvæ of the new *Cricula andrei*. Mr. Watson also exhibited a specimen of *Antheræa mylitta*, showing the first known case of regeneration of the lost part of an insect. The antennæ and membranes of one wing had been cut in opening the pupa. After emergence one antenna was perfect, and of the other only half remained, with the pectinations partly regenerated; the wound in the wing also had healed.—Mr. B. H. Crabtree, F.E.S., exhibited specimens of *Lycæna corydon* with female varieties, *syngrapha* and intermediates.

April 6th, 1910.—Mr. Johnson, F.E.S., the President, in the chair.—Mr. Mansbridge, F.E.S., gave a paper on "Mendel's Theory of Heredity, with Special Reference to Lancashire and Cheshire Variation." By means of diagrams he showed his experiments in breeding *Aplecta nebulosa* and its black varieties (*thompsoni* and *robsoni*), which seemed to follow Mendel's theory exactly. He also gave in detail his experiments in breeding *Boarmia repandata* and its black variety. He exhibited these and other species to illustrate his paper.—Mr. J. Ray Hardy exhibited a drawer of Coleoptera to illustrate the new arrangement of the collection in the Manchester Museum.—Mr. J. Watson showed living Hymenoptera bred from pupæ of *Papilio medon*, from Sierra Nevada.—Mr. A. E. Salmon exhibited living *Baccilus rossi*, an Indian stick-insect.—A. W. Boyd, *Hon. Sec.*

RECENT LITERATURE.

A Synopsis of the Orthoptera of Western Europe. By M. Burr, D.Sc. London. 1910.

"To work as a specialist is necessary; to think as a specialist may be dangerous" (Macfadyan). Burr's neat and handy volume on the Orthoptera of Western Europe is one that should help the naturalist, who likes to get a general bird's-eye view of that region of the field of Nature in which he works, as well as the specialist in Orthoptera, who will need to make a closer inspection of that small area he has chosen for his own. Almost of necessity our small total of some thirty-nine Orthoptera are contained in the four hundred or thereabout to be met with on the western fringe of the Old World; but who knows whether a British naturalist, armed with this "pocket" handbook, may not be able to add to our restricted list the names of some species which ought to occur with us, and possibly only need looking for to reveal their presence. I refer to such species as *Chelidura acanthopygia*, *Stauroderus biguttulus*, *Chorthippus longicornis*, *Tettix fuliginosus*, and several others. It goes without saying that the work would have been enhanced by illustrations, but so also would the price. A structural plate explanatory of terms used does, however, seem a desideratum, especially for such as do not make a speciality of the Orthoptera. The 398 species are distributed as follows:—Earwigs, 25; Cockroaches, 22; Mantids, 13; Phasmids, 4; Acridians, 134; Locustids, 164; Crickets, 36. An appendix brings the nomenclature up to date.—W. J. Lucas.

Bulletin of Entomological Research Committee; issued by the Entomological Research Committee (Tropical Africa) appointed by the Colonial Office. Vol. i. pt. 1, pp. 1–88. 4s. London: Longmans, Green & Co. April, 1910.

In this bulletin we have the first record of the doings of the Committee, of which the Earl of Cromer is chairman and Mr. Guy A. K. Marshall is scientific secretary, whose object is "to procure the fullest possible knowledge of the insects of tropical and subtropical Africa." That this is a formidable but at the same time most useful task can easily be imagined, and any doubt with regard to it will be removed after reading Dr. A. E. Shipley's admirable introduction to the part before us. Some of the richest tracts of Africa are almost closed to the white man by the presence of inimical insects and ticks. This state of things the Committee intend to alter, by means of the closest study of these animals and their life-histories, and of the organisms which prey upon them in their turn. Two experienced entomologists, Messrs. S. A. Neave and J. J. Simpson, have already left England to work upon the spot, while the Committee are further prepared to cope with the material which reaches them from Africa. In addition to the foreword the present part contains articles on African Fruit-flies (E. E. Austen), Blood-sucking Diptera (Dr. R. E. Drake-Brockman), Hemiptera injurious to Cocoa (G. C. Dudgeon), Parasites on Silkworms (*ibid.*), Scale Insects from Uganda (R. Newstead), Larval and Pupal Stages of Culicidæ (W. Wesché), &c. There are eight fine plates and other illustrations.—W. J. L.

THE ENTOMOLOGIST

VOL. XLIII.] SEPTEMBER, 1910. [No. 568

THE INTERNATIONAL CONGRESS OF ENTOMOLOGY.

By H. Rowland-Brown, M.A., F.E.S.

As the first Congress of Entomology ever held, the International Congress which met at Brussels on August 1st, and continued in session for the whole of the following week, marks an epoch in the history of our science. We owe, therefore, a deep debt of gratitude to Mr. Walter Rothschild, Dr. K. Jordan, and those others who took the initiative in the matter, and now that all is over we congratulate them heartily on the success which has attended their endeavours. The muster of members (260 men and 33 ladies) was in every way gratifying; the number of Universities, Museums, Institutes, and Societies (270 in all) who have given their names also as supporters, is agreeable proof that Entomology is recognized as entitled to rank with the progressive forces of the scientific as well as the economic and commercial world. Our only regret is that so comparatively few of the active field-workers in our own country should have found it possible to attend. But when we remember that the first week in August is usually the first—and sometimes the only—week's holiday vouchsafed to many of us, we are the better able to understand why so many faces familiar at our London, Birmingham, and Manchester meetings were conspicuous by their absence. The next Congress, we are pleased to hear, is fixed for Oxford in 1912; we trust that it may be convenient to select a date in September, when we are less loth to exchange the open country for the conference chamber.

Among those who assisted, however, Great Britain and Ireland achieved a large majority, including the following Fellows of the Entomological Society of London:—Messrs. G. J. Arrow, R. S. Bagnall, Dr. Malcolm Burr (an indefatigable International Secretary), G. C. Champion, E. M. Dadd, Dr. F. A. Dixey, H. St. J. Donisthorpe, H. Eltringham, C. J. Gahan, A. T. Gillanders, Sir Archibald Buchan-Hepburn, Bart., J. M. Howlett, A. H. Jones, Dr. K. Jordan, E. G. Joseph, Dr. G. B. Longstaff, G. A. K. Marshall, G. Meade-Waldo, F. Merrifield, Professor E. B. Poulton, Professor R. C. Punnett, the

Hon. Walter Rothschild, the Hon. N. C. Rothschild, H. Rowland-Brown, W. Schaus, Professor F. V. Theobald, R. Trimen, and C. J. Wainwright; while to these may be added the names of Dr. G. H. Carpenter, Dr. R. S. MacDougall, Sir Daniel Morris, Mr. W. B. Sturgess, and Mr. R. Vaughan-Williams; and of the following ladies:—Mrs. Malcolm Burr, Mrs. Donisthorpe, Mrs. Longstaff, Mrs. Morris, Miss Merrifield, Mrs. and Miss Poulton, Miss Rowland-Brown, and Miss Trimen.

Proceedings opened on the evening of July 31st, with an informal gathering at the Taverne Royale, where Professor Lameere, Rector of the Free University of Brussels and President of the Entomological Society of Belgium, and Madame Lameere, received such members as had already arrived, with the charming grace which is characteristic of Belgian hospitality. Meanwhile, M. Severin, in whose hands the arrangements for the Congress had been largely confided, assisted by Madame and Mademoiselle Severin, handed to each of us the "orders of the day," and the prettily designed silver badges to be worn by those assisting, together with several invitation cards for reunions and receptions at the Museums, &c., with which Brussels is particularly well equipped.

At half-past ten next morning, August 1st, Professor Lameere, in a pleasant speech of welcome, declared the Congress open. M. Severin, the General Secretary, read his report, and M. Y. Sjöstedt, the famous Swedish explorer and orthopterist, speaking in German, explained the entomological work done by the Swedish Kilimanjaro Expedition, of which he was the leader, illustrating his remarks with many extremely interesting lantern pictures. Over eleven hundred new species of insects, he said, had been added to our knowledge of the insect fauna of Africa, as a result of the exploration of the great mountain and its surrounding districts.

In the afternoon, in the Economic Section, among other papers, Professor F. V. Theobald discoursed on the "Artificial Distribution of Insect Pests"; Dr. R. S. MacDougall read a paper on "*Galerucella lineola*," explaining the damage done to osiers by this particular beetle, and suggesting measures for prevention and cure; and Sir Daniel Morris detailed the excellent work done by his department in the West Indies to control the introduction of insect pests by means of insecticides, and precaution of quarantine and inspection after the admission of seeds and plants; paying a high tribute to the discoveries made by Mr. H. Maxwell-Lefroy, F.E.S., at present Entomologist to the Government of India. Meanwhile, Sections ii. and iii. were busy discussing Systematics and Nomenclature respectively.

On Tuesday the General Meeting listened with rapt attention to the oratory of Dr. R. Blanchard, of Paris, who spoke at great length, and with admirable clearness and force, upon the relations of entomology to medical science, his speech being in fact a summing-up of our present knowledge of bacteriological medicine, and the part played by the mosquito and other insects in the dissemination of disease. Hardly less eloquent was Father Wasmann, on the popular subject of "Ants and their Guests," but, to the general disappointment, M. Forel, who was to have spoken on "The Geography and Philogeny of Ants," was unable to be present. In the afternoon three Sections were again formed: one for the discussion of Insect Bionomics, Physiology, and Psychology; one for Economic and Medical Entomology; and a third for the further consideration of the vexed problem of Nomenclature. In the second, among others, Professor F. V. Theobald read a paper on "The Distribution of the Yellow Fever Mosquito, *Stegomyia fasciata*," and Dr. G. H. Carpenter "Notes on the Œstridæ"; being an account of experiments to elucidate the life-history of *Hypoderma bovis*, and the economic value of preventive treatment, with further observations on the warble-fly of the reindeer, *Œdemagena tarandi*. In the third Section Dr. K. Jordan assisted the discussion upon Nomenclature.

Wednesday was a field-day for the evolutionists, and here Dr. F. A. Dixey's address on "Mimicry" drew one of the largest audiences of the Congress. Indeed, it was early apparent that the arrangement whereby six speakers were put down to give their views on this and kindred subjects could by no means be followed out, and after Professor R. C. Punnett, of Cambridge University, had delivered his lecture on "Mendelism and Lepidoptera"—a lucid summary of Mr. Bateson's and his own researches in this highly technical branch of entomology—there was only time for Dr. Jordan to read his paper on "The Systematics of certain Lepidoptera which resemble each other, and their bearing on General Questions of Evolution," the afternoon being devoted to expeditions not strictly entomological—to the Tervueren Museum, replete with exhibits of all sorts exclusively from the Congo; to the field of Waterloo; and to the Forest of Soignes. A special Section was announced for Thursday, to supplement the day's unfinished programme.

Thursday, in consequence, was an exceptionally busy day, for, apart from the General Meeting of the morning, when Dr. Burr delivered Mr. H. St. J. Donisthorpe's address on "Ants and their Guests," and the President of the Entomological Society of France, M. Künkel d'Herculais, read a paper on "Locust Ravages and their Prevention," members of the Congress were invited to inspect the Natural History Museum of Brussels, and to be photographed thereat, as soon as the afternoon Sections had concluded their work.

So, after the veteran Mr. Merrifield had summed up with admirable lucidity and conciseness the results of his temperature experiments on *Araschnia levana* and *Selene bilunaria*, showing that by the control of the larva and not the pupa it was possible to produce "first-phase" forms in the second brood, Mr. W. Schaus opened the battle against Professor Poulton, F.R.S., basing his contrary views on the subject of mimicry and its meaning upon observations made during many years passed in the neo-tropical regions of America. Unfortunately, after Mr. Schaus had spoken there was no one to take up the cudgels for him. A one-sided contest terminated after further remarks from Mr. R. Trimen, F.R.S., Mr. G. A. K. Marshall, Dr. Dixey, F.R.S., and other recognized British and German authorities on the subject.

Meanwhile, other Sections were at work (1) upon Bionomics, Physiology, and Psychology, and (2) upon Systematics, many of the most distinguished Continental entomologists assisting, including Dr. W. Horn, of Berlin, M. E. L. Bouvier, of the Paris Zoological Museum, and M. P. Bachmetjew, of Sofia.

On Friday, August 5th, the morning was once more devoted to general business, M. Lameere, the President, giving a *résumé* of the work done by the Congress, and the important questions being settled of the time and place of the next meeting. By a large majority it was decided to hold a Triennial Congress, but as this year's proceedings clashed with those of the Zoological Congress, and it is undesirable that this should again occur, it was agreed to accept the kind invitation of the University of Oxford, conveyed through Professor Poulton, and to convene the next international assembly in 1912. The technical work of the Congress, however, was not quite finished, and in the afternoon Sections were at work on "Museology, and the History of Entomology," and Zoogeography; Mr. J. M. Howlett, F.E.S., among others, speaking on the "Preservation of Collections in Tropical Climates," and Dr. W. J. Holland, F.E.S., of Pittsburg, U.S.A., contributing a valuable paper "On the Conservation of Types in Museums."

In the evening a banquet at the Taverne Royale, attended by some two hundred members, was made the occasion of some pleasant after-dinner speeches, realizing in every particular that "brevity is the soul of wit," and this brought the formal proceedings to a close, although many of the foreign visitors remained to take part in the charming Saturday excursions to the old Flemish towns, arranged and led by members of the Entomological Society of Belgium, and the Sunday State reception at the historic "Hotel de Ville," by the Mayor and Corporation, His Majesty King Albert being of course prevented from receiving this or any other Congress by reason of the Court mourning.

In conclusion, the writer of this necessarily brief report would like to point out that space alone prevents him from enumerating more precisely the work of the Congress, and from mentioning even the titles of the many valuable contributions made by authors other than those who are his fellow-countrymen. In a few months' time the "Transactions and Proceedings of the First International Congress of Entomology"* will make their appearance, and then it will be for the general public to decide how far entomology, from being the Cinderella of the Natural Sciences, has established a claim to take rank as a leading lady!

A NEW ANOPHELINE FROM SOUTH AFRICA.

By H. F. Carter.

Pyretophorus transvaalensis, sp. nov.

Head with white scales in front, black behind; palpi with two broad apical white bands and a narrow basal band. Thorax grey in the middle, dark at the sides; covered with narrow-curved pale grey scales. Abdomen brown with golden hairs. Legs brown with very faint apical banding. Wings with light and dark scales; six costal spots, the first and fourth spreading evenly on the first long vein, the two basal ones small.

♀. Head dark, densely clothed with upright-forked white scales in front, black ones behind; a tuft of long white hairs projecting forward between the eyes; antennæ brown with white pubescence; palpi, thin, dark brown with two broad apical white bands and a narrow basal band.

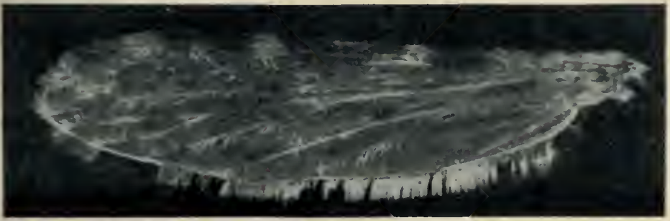


Fig. 1, wing of *Pyretophorus transvaalensis*, n. sp.

Thorax grey in the middle with three longitudinal dark lines, deep brown at the sides, clothed with pale grey, somewhat elongated, narrow-curved scales; scutellum dark in the centre, greyish brown, laterally with scales similar to those on the thorax, border bristles missing. Abdomen deep brown with golden hairs. Legs brown, with very faint white apical spots, rather larger at the apices of the tibiæ.

Wings with six costal spots, the two basal ones somewhat small; the first and fourth spot spread evenly on to the first long vein, the second and third are larger than the others, and the corresponding area of the former on the first long vein is interrupted by a few yellow scales, the latter spot spreads evenly on to the sub-costal vein, but on the first long vein the end nearest the base of the wing is replaced by yellow scales; the upper branch of the first fork cell has two dark areas, one a short distance from the apex, the other a similar distance from the base of the cell, the lower branch also with two dark areas, the apical one small, reaching to the costa, the basal one large; the stem with a dark-scaled area just before and one just after the supernumerary cross-vein; third long vein with two spots, one large and reaching almost to the costa, the other small and situated just in front of the mid cross-vein; the fourth long vein with a dark area just after the base of the cell and one towards the base of the wing; the cell has two spots on each branch, two being basal and two apical; on the fifth vein there is a spot at the base of the wing, and on the upper branch of the cell three dark areas, the first very near the apex, the third at the base and extending a short distance on to the stem, there is also a dark patch at the apex of the lower branch; the sixth vein has three small spots; fringe with pale spots where the veins join the costa; apex yellow; first submarginal cell longer than the second posterior, its stem about half the length of the cell; stem of second posterior cell rather longer than the cell; supernumerary cross-vein placed slightly in front of the mid, posterior about its own length distant from the mid.

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* A detailed account of the Congress and its work was published in 'The Times' of Wednesday, August 10.

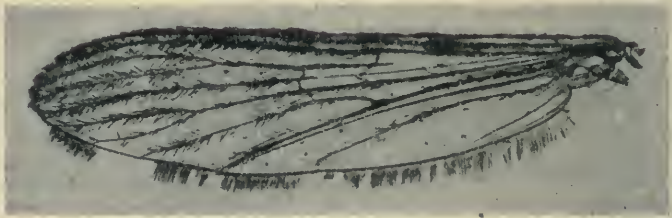

Fig. 2, wing of *Pyretophorus transvaalensis*, n. sp.

Length 4 mm. (rather over).

Hab.—Leysdorp, Transvaal (sent by Dr. Copland to Mr. F. V. Theobald).

Observations.—Described from two females. It comes near *P. sergentii*, Theobald, but differs from it in the wing-spotting and the leg-banding.

SOME BEES FROM HIGH ALTITUDES IN THE HIMALAYA MOUNTAINS.

By T. D. A. Cockerell.

Among the various materials which pass through one's hands from time to time, some excite unusual interest on account of the place they come from. After reading the published account of the adventures of the British Thibet Expedition in the higher passes of the Himalayas, it was naturally a great pleasure to be able to study some of the bees collected at those high altitudes, representing a hitherto unknown series of species, wholly different from those of the lower and well-known slopes of the mountains.

All the specimens are of course in the British Museum.

Bombus waltoni, sp. nov.

♀. Length about 17½ mm.; expanse about 34; hair of head and thorax black, with a slight admixture of greyish on mesothorax and scutellum, only noticed under a lens; hair of first abdominal segment and base of second appearing a sort of grizzled black, the black hairs being tipped with greyish white; hair of apex of second segment, and all the following ones bright ferruginous tipped with dull white, giving an obscurely banded effect; legs black, with black hair, the middle and hind tarsi ferruginous, with ferruginous hair; hind tibiæ with some ferruginous hairs. Head long; ocelli rather large; area below lateral ocelli smooth, with sparse very distinct punctures; third antennal joint long, a trifle longer than the next two combined; malar space smooth and shining, very long, though less than twice as long as apical width; clypeus convex, the disc smooth, with faint rudimentary punctures; mandibles with a straight cutting edge, apex covered with light yellow tomentum; wings translucent, reddish-tinged; last ventral segment with a delicate median groove.

This is quite different from all the Indian species. In Friese's table of European species it runs straight to *B. pomorum*, from which it is easily known by the much longer third antennal joint. In Friese's table of Arctic species it runs to *B. hyperboreus*, which it does not much resemble. The colour-arrangement is like that of *B. alpinus*, *B. lapponicus* v. *lugubris*, and *B. rufus*. The Chinese *B. rufus*, Friese, is evidently different by the short velvety hair, our insect having the hair long and loose, especially on the abdomen; *rufus* also has the malar space shorter. *B. alpinus* is considerably larger, with shorter malar space. *B. lapponicus* has the malar space much shorter.

Hab. Khamba Jong, Sikkim, 15–16,000 ft., July 15th–30th, 1903 (Thibet Expedition). British Museum.

Also from Khamba Jong were *Anthophora pulcherrima*, Bingham (variety), *A. khambana*, Ckll., and *A. megarrhiza*, Ckll. From Gyangtse came *A. megarrhiza soluta*, Ckll. These are described in a paper dealing with the genus *Anthophora*, sent to 'Annals and Magazine of Natural History.'

Nomada waltoni, sp. nov.

♀. Length 9½ mm., expanse about 17½; head and thorax strongly punctured, black with light markings; pubescence scanty; head broad; eyes reddish grey; mandibles simple, labrum with a small tooth next to lower border; clypeus (except upper margin, especially sublaterally), labrum, lateral marks, mandibles except tips, and a narrow band up posterior orbits (omitting upper quarter) all light yellowish ferruginous; lateral marks broad below, with an inner projection pointing toward upper end of clypeus, and above ending in a point, separated from orbital margin, at about the level of antennæ; clypeus with minute punctures, and the lower half, especially toward sides, with scattered large ones; scape in front and flagellum beneath yellowish ferruginous, but the latter becoming dusky beyond the basal third; upper side of antennæ dark, the second and third joints reddish; third joint longer than fourth, but not greatly so; mesothorax closely punctured, but shining between the punctures; scutellum pale yellow, flattened, not at all gibbous; postscutellum obscurely reddish; area of metathorax dull, minutely roughened; upper border of prothorax, tubercles, and a large transverse patch on pleura pale yellow, the pleural patch suffused with red around the edges; no metathoracic spots; sternum ending between the hind coxæ in a triangular shining process, which is truncate at the end; tegulæ pale reddish, light yellow anteriorly; wings rather dusky, slightly reddish, the slender stigma ferruginous, nervures fuscous; b. n. barely falling short of t. m.; second s. m. broad, receiving r. n. beyond the middle; third s. m. greatly narrowed above; legs bright ferruginous, the tibiæ a little suffused with yellow; outer side of hind coxæ yellow; anterior coxæ with stout spines; abdomen finely but very distinctly punctured, with entire cream-coloured bands on all the segments, that on the first with a ferruginous mark on each side, that on the second very broad laterally, but much narrowed in the middle; ground colour before the second band ferruginous, after it black or nearly; pygidial plate black, extremely broad; venter with four broad cream-coloured bands.

Hab. Gyangtse, 13,000 ft., June, 1904 (H. J. Walton; Thibet Expedition). British Museum.

This is a typical member of the subgenus *Micronomada*, related to such species as the American *N. snowii* and *N. ridingsii*. In Schmiedeknecht's table of Palæarctic species it runs to *N. coxalis*, Morawitz, to which it appears to be allied, differing, however, greatly in coloration, and in the flattened scutellum. In the table of Indian species given by Nurse (Ann. Mag. Nat. Hist. June, 1903, p. 545) it runs nearest to *N. arida*, but differs in many particulars.

Melitta altissima, sp. nov.

♀. Length 13–15 mm.; black, with black and greyish white hair, the abdomen beyond the second segment covered with bright ferruginous hair; head and thorax shining, with close shallow punctures; a smooth space on each side of ocelli; clypeus densely punctured above, sparsely and irregularly, but more or less grooved, below, and with a median smooth line; labrum with a shining median tubercle; tongue slender dagger-shaped, formed, with the small paraglossæ, as usual in the genus, but rather longer than in *M. leporina*; first joint of labial palpi not so long as the next two together; antennæ black, the flagellum obscurely ferruginous beneath; hair of head long and black, strongly mixed with pale grey on the face, of thorax also long and black, with a broad grey band (mixed with black) extending from tubercles across anterior part of mesothorax, and some long white or pale grey hair at sides of metathorax; middle of disc of mesothorax, anterior part of scutellum, and postscutellum smooth and shining; metathorax dullish; pleura closely punctured; tegulæ small, piceous; wings a little dusky, especially along apical margin; nervures brown, stigma ferruginous; b. n. meeting t. m., or failing to reach it by a short distance; first r. n. joining second s. m. at end of first third; third s. m. narrowed more than half above, receiving second r. n. about as far from apex as first r. n. is from apex of second s. m.; stigma small; marginal cell pointed; legs black, with black hair, that on inner side of tarsi variably reddish, and sometimes orange on inner side of middle tibiæ; claw-joints ferruginous; spurs ferruginous; abdomen finely punctured; first segment with mostly white hair, but black posteriorly, second with black, the others with appressed bright fox-red hair, but that on sides of fifth white; venter with black hair, white on sides of apical palpi; pygidial plate small.

This might be taken for an *Andrena,* but it has the *Melitta* venation, no facial foveæ, and straight hairs, but no floccus, on hind trochanters.

Hab. Gyangtse, 13,000 ft. June, 1904 (H. J. Walton; Thibet Expedition). British Museum. Two females.

Easily known from all other species by its coloration. The genus is now first recorded from the Himalayas, but years ago Colonel Bingham showed me an undescribed *Melitta* from this region.

Colletes sanctus, sp. nov.

♀. Length about 12 mm., expanse about 22; black, the head and thorax above covered with bright fox-red hair; at sides and beneath, and on legs, it is pale yellowish, but the bright red extends down beyond and over the tubercles. Abdomen shining black, finely punctured, with scanty pale hair at base, but beyond that with black hair, which is very inconspicuous; no indication of pale bands. Mandibles reddish at apex; antennæ entirely black, the third joint not quite so long as the next two together; front densely punctured; facial foveæ much as in *C. succinctus*, but narrower, and well-defined on the inner side; clypeus prominent, densely and coarsely striatopunctate; malar space large, but broader than long; mesothorax and scutellum with dense large punctures, except discally, where they become smooth and sparsely punctured (scutellum) or impunctate (mesothorax); pleura with close strong punctures; area of metathorax with coarse ridges bounded as usual by a transverse keel, the enclosed spaces small, irregular, longer than broad; sides of metathorax rough; tegulæ piceous; wings dusky hyaline, nervures and stigma dark reddish; second s. m. very broad, receiving first r. n. a short distance beyond middle; legs normal, hind spur ciliate; first abdominal segment shining, with small scattered punctures; the others with minute, much closer punctures.

A species rather suggestive of the American *C. myroni*, Ckll., but that is smaller, and has the malar space much shorter, and the face with black hair. The colour-effect is very like that of the South American *Biglossa thoracica*, Friese. I do not know any closely allied species among the Old World *Colletes*.

Hab. Gyangtse, 13,000 ft. June, 1904 (H. J. Walton; Thibet Expedition). British Museum.

While on this genus I take the opportunity to propose a new subgenus *Rhinocolletes* for *Colletes nasutus*, Smith. This species is not only remarkable for the long face, but the lobes of the tongue are excessively long and narrow, suggesting some Eumenid wasp.

Anthidium philorum, sp. nov.

♀. Length 10 mm.; black, with rather dull white hair, that on abdomen yellowish except first segment and sides of the following two; ventral scopa orange; head and thorax very densely punctured, their tegument all black except a small pyriform pale yellow spot above each eye, and sometimes two short marks on scutellum; mandibles with a long apical tooth and four very distinct inner ones; antennæ black; eyes green; tegulæ black; wings dusky but translucent, b. n. going basad of t. m.; legs without light markings, but the tarsi brownish to dark ferruginous, with orange hair on the inner side; no trace of pulvilli; abdomen with six entire cream-coloured bands, the first two having a black spot on each side, the others with an anterior notch, or the first band divided into four transverse spots, and the second notched like the third, while the second to fourth are much constricted in the middle; apical segment with a triangular tooth on each side.

An ordinary looking little species of *Anthidium*, s. str., resembling the American *A. emarginatum*. It is quite distinct from all the recorded Indian species, and also from the Palæarctic forms. In Friese's table it runs to 20 (*obscuratum* and *septemspinosum*), and runs out because of the orange scopa.

Hab. Gyangtse, 13,000 ft., June, 1904 (H. J. Walton; Thibet Expedition). British Museum. Two females.

ON THE ICHNEUMONIDÆ OF 'FAUNA BOREALI-AMERICANA.'

By Claude Morley, F.Z.S., F.E.S.

'Fauna Boreali-Americana; or, the Zoology of the Northern Parts of British America,' by John Richardson, M.D., F.R.S., F.L.S., assisted by William Swainson, F.R.S., F.L.S., and The Reverend William Kirby, M.A., F.R.S., F.L.S.; Norwich, 1837. Part the Fourth and Last:—The Insects, by the Rev. William Kirby.'

This is a rare book, and the Insects (vol. iv.) is now quoted by Quaritch at £5 10s. It was William Kirby's (thirty-fifth and) last publication, when in his seventy-eighth year, and it immediately followed his Bridgwater Treatise of 1835, so unnecessarily adversely criticised in the old Ent. Mag. Kirby had no especial knowledge of the Ichneumonidæ, which appears strange in view of his wide acquaintance with the Aculeata, till one remembers the chaos then obtaining in this family; and he was not a subscriber to Gravenhorst's work of 1829.

In Sir John Franklin's first and second expeditions to the Polar Seas, Dr. Richardson was associated with him and entrusted with the charge of the Natural History department, a feature of which was the insects collected during the brief summers of the Arctic regions. Richardson on his return applied to Sir W. J. Hooker to describe the insects, and the latter immediately wrote to Kirby and induced him to undertake the task. The insects were forwarded to Barham Parsonage, Suffolk. Richardson wrote to Kirby from Chatham on May 15th, 1829, that the majority of the collection consisted of Coleoptera, owing purely to the inconvenience of preserving the more fragile insects, and this probably accounts for the paucity of Ichneumonidæ, of which some two hundred species were known from the same district in 1842 (*cf.* Sir John Richardson's 'Arctic Searching Expedition,' ii. 352).

"The insects were presented, in the joint names of Dr. Richardson and Mr. Kirby, to the British Museum" (Freeman's 'Life of Kirby' [1852], 449); but there is no mention whatever of their reception in the official "Accession Book" nowadays. The specimens are, however, recognizable by the fact that they are ticketed with a small green, diamond-shaped label, bearing an MS. capital *R*. Only five species of parasitic Hymenoptera are enumerated by Kirby:—

Fœnus jaculator, Linn.

Ichneumon ferrugator, sp. n., p. 258; no sex nor number of specimens indicated.—Since my remark upon this species was published (Entom. 1909, p. 133), I have found in the General Collection four specimens of *Banchus ferrugineus*, Provancher (Nat. Canad. 1877, p. 14, &c.), bearing the characteristic green labels, and well representing Kirby's description. One of these is the type, and the species, which is merely referred to by Cresson (Trans. Amer. Ent. Soc. 1877, p. 207), must be known as *Banchus ferrugator*, Kirby.

Cryptus viduatorius, Fab., p. 259; one specimen taken in lat. 54.—I cannot find this in the British Museum; Fabricius' species is, I believe, unknown outside Europe.

Cryptocentrum lineolatum, sp. n., p. 260 (♀ *sic*). = *Rhyssa persuasoria*, Linn. ♂, var. areola alarum nulla.—In the Collection is a specimen of this species agreeing so entirely with Kirby's description and figure, especially in its lack of areolet and dark hind femoral coloration, as to leave no doubt that the labels of this and that specimen regarded by me as the type (Entom. 1909, p. 133) had become accidentally transposed. This point, with Mr. Waterhouse's concurrence, I have rectified.

Bracon crocator, sp. n., p. 261.—Type in coll. Brit. Mus.

Dr. L. O. Howard tells me that he does not believe these species were known to Cresson when he wrote his 'Notes on Species of Ichneumon found in America North of Mexico' (Philad. 1877), and he also hardly thought Provancher knew them, which is now evident.

Clare Island, Co. Mayo: July 27th, 1910.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 223.)

Miltochrista tricolor, sp. n.

♂. Head and thorax crimson, the latter marked with dark grey; abdomen cinereous, faintly tinged with reddish, anal segment pale ochreous brown. Fore wings crimson with yellow patches on the central and outer areas, and four dark grey transverse bands; subbasal and antemedial bands curved towards each other, touching about middle; postmedial line curved, hardly separate from the sinuous and interrupted submarginal band. Hind wings pale ochreous, suffused with reddish.

Expanse, 28 millim.

Collection number, 762 *a*.

A male specimen from Kanshirei (1000 ft.), October, 1908.

Somewhat near *M. cuneonotata*, Walk.

Miltochrista tridens, sp. n.

♂. Fore wings orange-red, markings black; medial line almost straight, not reaching the costa; lower half of postmedial almost parallel with the medial line to the middle, where it is bent outwards, thence broadly dentate to costa; a dot at base of the wing, and another at end of the cell; from the latter is a dash, which with two teeth of the postmedial roughly represent a trident; three dots on outer margin towards apex, and one about the middle. Hind wings pale ochreous brown, suffused with pinkish; three dusky dots on outer margin near costa; fringes pink. Under side paler than above, the black dots on outer margin fairly distinct, but the other markings very faint.

Expanse, 32 millim.

Collection number, 763.

One male specimen from Kanshirei (1000 ft.), October 29th, 1908.

Diacrisia fumida, sp. n.

♂. Head and thorax brownish buff, face and palpi blackish; abdomen reddish above, buff beneath, an interrupted black dorsal line and black lateral spots, anal tuft brownish buff. Fore wings brownish buff, smoky tinged; discal mark and oblique postmedial line dusky, indistinct, marked with black towards apex and inner margin. Hind wings rather paler, a few reddish hairs towards the base; a large blackish spot at end of cell, a small one on outer area between veins five and six, a double one near anal angle, and one on the interspace above. Under side brownish buff; in addition to the markings of the upper side, which here are more distinct, there are a blackish streak above the inner margin and a small blackish cloud in the cell of fore wings; the hind wings also have a short blackish bar in the cell in addition to the other markings.

♀. Similar to the male, but the markings on the hind wings are larger, and there are four spots before the anal angle. A black spot on the back of each segment of the abdomen.

Expanse, ♂ 44 millim., ♀ 52 millim.

Collection number, 1787.

The female of this species was described by Hampson as the female of *Diacrisia neurographa* (Ann. & Mag. Nat. Hist. (8), iv. p. 361, 1909); the female of the latter species, however, has so far not been discovered.

Several specimens from Rantaizan (7500 ft.), May, 1909.

Diacrisia solitaria, sp. n.

♀. Antennæ black, apical fourth pale grey-brown; head and thorax, prothorax, edged with yellowish, a blackish central line on rest of thorax; abdomen yellow, barred and spotted with black, except on first and last segments. Fore wings pale grey-brown with a faint pink tinge; a black dot at base below costa; a black spot on costa at one-third, and a black spot below it on the inner margin; a black spot on costa at two-thirds, two below it in the cell, and four towards the inner margin—the upper two of the latter are much smaller than the others. Hind wings suffused with fuscous; a black spot at end of the cell and a dusky mark in the cell; a series of black spots, between the veins, on outer margin, the upper ones faint, and the others more or less quadrate.

Expanse, 52 millim.

Collection number, 765.

One female specimen from Kanshirei (1000 ft.), April 20th, 1906.

Diacrisia punctilinea, sp. n.

♂. Head and thorax orange-red, face paler; abdomen pale reddish, dotted on back and sides with black. Fore wings reddish orange; a black spot at base of the costa; ante-, postmedial, and submarginal lines represented by black spots between the veins, the first line curved, the second inwardly oblique, and the third undulated. Hind wings paler, a black spot on the outer area before the anal angle. On the under surface, which is paler than above, the only distinct black marks on the fore wings are—a spot on costa, one at end of cell, and four upper spots of the submarginal series.

Expanse, 34 millim.

Collection number, 768.

One male specimen from Kanshirei (1000 ft.), April 18th, 1906.

Aloa vivida, sp. n.

♂. Head and thorax brownish buff; abdomen scarlet with medial and lateral series of black dots. Fore wings brownish buff with a faint pink tinge; a black dot on vein one before the middle, an obscure blackish shade-like streak runs from just beyond the middle of the inner margin almost to the apex, and on this are some black dots at each extremity; on the inner marginal area of the right fore wing there is a black dot on vein three, and on the left fore wing vein four divides an indistinct black dot; discal dot blackish, indistinct; fringes pale buff. Hind wings scarlet, paler towards the base; fringes yellowish buff. Under side deep pinkish buff, the fore wings suffused with scarlet.

♀. Similar to the male but larger; the fore wings have black dots on veins three and four; the hind wings have a distinct black discal spot, and two blackish dots towards anal angle.

Expanse, ♂ 46 millim., ♀ 62 millim.

Collection number, 1204.

The male described above was taken at Kanshirei (1000 ft.), April 19th, 1908, and the female at Rantaizan (7500 ft.), May 9th, 1909. Another male specimen from Kanshirei (March 7th, 1908) has the oblique streak on fore wings less distinct; and a second example of the female (Kanshirei, April 21st, 1908) has the black markings somewhat heavier, but the dots towards anal angle are absent.

Aloa postrubida, sp. n.

♀. Head and thorax pale buff, the latter with a central velvety black spot; abdomen yellowish buff with medial and lateral series of black spots. Fore wings pale buff, slightly tinged with pink; a black dot at base near the costa, two black dots placed obliquely on inner margin, a postmedial series of five black dots, and a sixth dot at upper angle of cell, and out of line with the postmedial series. Hind wings pinkish red, base, abdominal margin, outer extremities of the veins, and the veins pale buff. Under side buff, discal area of the fore wings between the veins pinkish red; a black dot at upper angle of the cell, and a smaller point above it; hind wings tinged with pinkish red towards base of the costal area; a black triangular discal spot, and two black dots on the inner margin before the anal angle.

Expanse, 50 millim.

Collection number, 1205.

One female specimen from Kanshirei (1000 ft.), July 27th, 1908.

Aloa contaminata, sp. n.

♂. Head and thorax whitish buff; abdomen scarlet with medial and lateral series of black dots. Fore wings whitish buff, streaked with fuscous between the veins, except on costal and inner marginal areas. Hind wings whitish buff suffused with scarlet, especially towards the abdominal margin; a blackish discal dot. Under side whitish buff, the fore wings strongly suffused with scarlet, and the hind wings slightly tinged with scarlet towards the abdominal margin.

Expanse, 48–52 millim.

Collection number, 1209.

Two male specimens from Kanshirei (1000 ft.), April 28th, 1908 (type), and May 5th, 1908.

Euproctis crocea, sp. n.

♂. Head yellowish; thorax and abdomen pale buff, the anal tuft tinged with reddish. Fore wings bright yellow; a bifurcate transverse band is indicated by three clusters of black scales in the cell, and three other clusters of black scales arranged obliquely below the cell; a postmedial band represented by scattered black scales; three black spots on the outer marginal area towards apex, one towards the inner margin, and some black scales between. Hind wings whitish, fringes yellow. Under side whitish, costa and outer margin of the fore wings, and the fringes of all the wings, yellow.

♀. The clusters of black scales forming the upper portion of the band on fore wings are less compact, the first and third of the apical black spots are larger, and the spot towards inner angle is double.

Expanse, ♂ 36 millim., ♀ 46 millim.

Collection number, 665.

A male specimen from Arizan (7300 ft.), August 15th, 1908; and a female from Kanshirei (1000 ft.), April 22nd, 1908.

Euproctis flexuosa, sp. n.

♂. Fore wings yellow; antemedial band slightly curved, but not extending to costa or inner margin; postmedial band flexuous, not reaching costa; both bands formed of scattered black scales, the first is followed by a pale line, and a similar line precedes the second; a black dot between the antemedial band and base of the wing; two black dots on the outer margin, one towards the apex, the other towards the inner angle. Hind wings rather orange tinted; fringes paler. Under side orange-yellow without markings.

♀. Similar to the male, but owing to condition of specimen only the central parts of the bands can be traced.

Expanse, ♂ 25 millim., ♀ 28 millim.

Collection number, 35.

One male specimen from Kanshirei (1000 ft.), April 29th, 1906; and a female from Tainan (on the plains), July 13th, 1904.

Euproctis striata, sp. n.

Fore wings yellowish buff, slightly mottled with russet; some irregular streaks, formed of black scales, between the veins on outer marginal area; a few scattered black scales on the disc. Hind wings russet tinged, as also is the under side of all wings; fringes paler.

Expanse, 21 millim.

Collection number, 35*a*.

A male specimen from Garambi, October 23rd, 1904.

(To be continued.)

NOTES AND OBSERVATIONS.

Hornets as Enemies of Arboriculture.—One of my neighbours, a Suffolk landed proprietor, is much interested in afforestation, and has planted several hundred acres with trees of various kinds. The other day, in the course of conversation regarding injurious insects, he informed me, much to my surprise, that the insects that did his trees the most harm were hornets, and that his men had been obliged to seek out and destroy all the nests of this species that they could find. The trees specially attacked are young ashes, when they attain the height of ten or fifteen feet, and that the same trouble had been experienced on the Duke of Grafton's estate at Euston. I visited the plantation indicated, and found several individuals of *Vespa crabro* at work, and evident signs of their depredations on the young trees. They remove the bark, at the height of ten or twelve feet from the ground, using it, no doubt, in the construction of their nests. Many of the young trees had three or four feet at the top entirely killed by the bark being gnawed off all round, and others had branches withered away from the same cause. The amount of damage was considerable, and there is no possible doubt as to the cause, as I saw the insects at their work, several of them removing and flying away with pieces of the bark while I watched them. I do not think it is generally known that hornets in this country do an appreciable amount of damage, and I think the matter is worthy of record.—(Lt.-Colonel) C. G. Nurse; Timworth Hall, Bury St. Edmunds, August 11th, 1910.

On the "Assembling" of Ægeria (Sesia) tipuliformis.—In the report of the Meeting of the South London Entomological Society on June 23rd (*antea*, p. 230), Mr. Noad Clark notes the "assembling" of *Ægeria tipuliformis* as taking place between one and two o'clock in the afternoon. I had an opportunity of observing the same interesting fact this year, though previously unaware that *Æ. tipuliformis* was an "assembling" species.

On Sunday, June 26th, the morning was hot and sunny, and about 9 a.m. I found a fine female *Æ. tipuliformis*, newly-emerged, on a currant-leaf in the garden. I boxed her for observation purposes, meaning to liberate her later in the day. About 2.30 p.m. I carried her down to the same currant fence from which I had taken her, and was immediately aware on opening the box of some insects, which at first I took to be Diptera, flying around me, and backwards and forwards in a very excited state. I soon saw they were *Æ. tipuliformis* males, and almost immediately my female was seized upon by one of them. I think the actual pairing took place in the air, but am not sure of this. The couple immediately settled down on a currant-leaf, and, to my surprise, on going to look at them an hour later, I found three other pairs within a couple of yards of the first, all quietly settled in the same position, *viz.* on the upper surface of the fourth or fifth leaf from the growing joint of the currant-shoot. The topmost shoots were in every case selected; I could not find any on the lower branches. The four pairs remained *in cop.* all the afternoon, though the sun shone brightly and continuously. By 6.45 p.m. one pair had separated, and I found the female resting underneath a leaf near by. Immediately afterwards, the pair first observed also separated; and at 7.20 this pair was still on the same leaf, but slightly farther apart. At 9.20 one of the two remaining pairs had separated; the other still remained *in cop.*, and it was too dark to make any further observations that night. The next morning was dull; at 8.45 the last pair had separated, the three other females being left alone, practically in the same positions as on the previous night. By 10 a.m. one of these had flown, and by 11 a.m., the sun having come out, all save the last separated female had disappeared. A little later, she too had gone, and though I looked for them many times later, hoping to see the females ovipositing, I never saw them again.—E. MAUDE ALDERSON, F.E.S.; Worksop, Notts, August 16th, 1910.

FECUNDITY OF ARCTIA CAIA.—On Aug. 11th a small boy brought me a battered female specimen of the garden tiger moth (*Arctia caia*) in a match box. As I noticed that she was ovipositing I left her, and by the evening of Aug. 12th she had laid some two hundred ova; a further batch of four hundred and fifty or so was laid on the 13th, and by the evening of the 14th the number had increased to 1150. On the 15th one hundred and thirty only were deposited, and on the 16th twenty-three, the insect then dying. I made a *post-mortem* examination, and found numbers of eggs still unlaid, and had no difficulty in counting one hundred and fifty. Even supposing that no eggs were laid before the moth was brought to me, surely this huge number of 1453 approaches a record?—G. LYLE; Brockenhurst, August 17th, 1910.

AN UNRECORDED FOOD-PLANT FOR EUPITHECIA VIRGAUREATA.—In my "Notes on the Genus *Eupithecia*" I discussed (Entom. xl. pp. 210, 211) the various recorded food-plants of this interesting and probably much-overlooked species; but I have only just discovered to-day that I *ought* to have been able to add another from my own personal experience. On August 15th, 1902, I beat from oak at Forres a single larva, which I entered in my diary as *E. castigata*. This duly produced a pupa, very unlike that of *castigata*, and the moth emerged on May 6th, 1903. I was struck by its close agreement with my (few and poor) *virgaureata*, and even placed it among these at first; but my ignorance of this species was at that time, as Mr. Tutt would say, "colossal," and believing it to be exclusively a golden-rod feeder, I kept reproaching myself for what I felt must be an absurd misidentification. Then, by an unfortunate chance, I discovered that the empty pupa-case closely resembled that of *E. vulgata*; and as the size and shape of my moth seemed to agree with that species, the date of emergence was about right, and remembering that its larva was similar to that of *castigata*, I transferred it to my series of *vulgata* as a fine "ab."! This was of course a gross mistake, and it is unpardonable that it has remained undiscovered until now; I can only plead in extenuation that it is notorious that Scottish *vulgata* are very different in colour and aspect from our southern ones. Now that I am more familiar with the facies of *virgaureata*, I can give the name of my long misidentified specimen with certainty. As it happens, it is a male, so that I was able to follow up my determination by the facies with an examination of the antennæ, and thus "make assurance doubly sure."—Louis B. Prout; 62, Graham Road, N.E., August 22nd, 1910.

Forficuline Maternal Care.—I recently noticed the following case. On the shore at Hayling Island I lifted a small stone—some 6–9 cubic inches—rather firmly fixed in the tenacious soil a little above the tide-line, and found under it a female earwig. The creature was covering a small cavity, and this cavity was filled with numerous minute young earwigs; only one young one was at large, and this was close to the mother. As the little family was evidently disturbed by the discovery I replaced the stone, and did not take possession of the mother. I feel pretty sure, however, that the species was *Forficula auricularia*, the common earwig. I noticed something of the same sort in the eastern Pyrenees many years ago, the species in that case being *Labidura riparia*. The psychology of these cases might give rise to interesting discussions. But at present I think all that can be considered certain is that association between mother and offspring is continued after deposition of the eggs, and is prolonged even after the hatching of the young.—D. Sharp; Brockenhurst, August 22nd, 1910.

CAPTURES AND FIELD REPORTS.

Synia musculosa in Wiltshire.—In classifying up a lot of my last season's insects from your 'Moths of the British Isles," I came across enclosed specimens. So far as I can judge, they agree with the illustration (plate 149, fig. 7) of *Synia musculosa*. I would like your opinion of same. I took six specimens last season, and have one this season "last night" at light.—H. Haynes; 6, Nelson Road, Salisbury, August 13th, 1910.

[The specimens (three males) are certainly *S. musculosa*. In a letter dated August 17th, Mr. Haynes notes the capture of two other specimens.—Ed.]

Locusta viridissima (Orthoptera).—During the last fortnight of July I found the nymph of this grasshopper in numbers at a certain spot on the cliffs at Beer, South Devon.—G. Lyle.

Lepidoptera at Gas Lamps.—We have taken a good many specimens of *Drepana binaria* off the gas lamps during the last fortnight. We also took a beautifully fresh specimen of *Pyralis costalis* at light, on August 16th.—CATHERINE HOLMES; Ruthven, Sevenoaks, Kent, August 18th, 1910.

TRIECPHORA VULNERATA (HOMOPTERA).—In mid-June last I took a specimen of this pretty scarlet-and-black bug, at rest on a grass-stem in Perry Wood, New Forest.—G. LYLE; Brockenhurst.

"A NEW NAME FOR THE 'BUG' HUNTERS."—Whilst staying at a most comfortable hotel in Forfarshire with my friends Mr. Horn of Aberdeen, and Mr. Craske of Slough, our nets attracted considerable notice, evidently never having been seen on those hills before, although much frequented by botanists. Our worthy and kind hostess, when appealed to by them as to what we were catching, replied, "Oh! butterflies, 'bumble' bees and those kind o' beasties!" "Ah!" said the botanists, "they have some scientific name, I think." "Yes," replied our most resourceful landlady, "but I forgot what it is. I believe they call themselves 'Thessalonians.'" Evidently she was of a Biblical turn of mind, and never lacked a reply to all queries! Needless to say, we were known during our stay there as the "Three Thessalonians" (amusing, if not scientific).—J. P. MUTCH; 405, Hornsey Road, London, N.

COLEOPHORA HEMEROBIELLA.—On Tuesday last I was watching a very wasp-like creature (a species of *Cerceris*, I suppose) dragging a dipteron almost as large as itself along the base of an old cherry tree trunk, when I noticed at rest thereon a *Coleophora*, which upon examination proved to be the above-named local insect. Although it was not uncommon in this district many years ago I believe, I began to think it had reached the vanishing point. On referring to my note-book, I find that it is just twenty years (July, 1890) since I last met with *C. hemerobiella* in the perfect state. Upon further search I found another specimen on the same tree, but was unable to find any more; however, it is very satisfactory to know that the species is still to be found in this disirict.—A. THURNALL; Wanstead, August 4th, 1910.

COREMIA QUADRIFASCIARIA IN SURREY.—I took a fine male of this species on June 24th last at Godalming, but having to leave next day I had no opportunity of working for it. Although near Guildford and Gomshall, this locality is, perhaps, worth recording, as the soil is quite different.—(Captain) P. A. CARDEW; 50, Melbury Gardens, Cottenham Park, Wimbledon, August 16th, 1910.

SENTA MARITIMA IN SURREY.—I was surprised to take last evening on a lamp opposite the racecourse, Sandown Park, a fine male specimen of *Senta maritima* (*ulvæ*). My friend Mr. Warner, of Felixstowe, was with me. Possibly the insect may have flown from the Black Pond at Esher.—PERCY RICHARDS; Wellesley, Queen's Road, Kingston Hill, August 10th, 1910.

[We believe that there is no previous record of *S. maritima* in Surrey. Until its occurrence in Sussex was noted in 1908 (Entom. xli. 204, 231), the species was supposed to be almost entirely confined, in Britain, to the Eastern Counties.—ED.]

Grammodes algira at Hackney.—We are informed that at the meeting of the Chingford Branch of the North London Natural History Society held at Chingford on Friday, July 29th last, the Secretary, Mr. J. O. Braithwaite, exhibited a fine specimen of the above Continental moth, taken alive by him in the stores at Ash Grove Works, Ash Grove, Hackney, on July 12th. The insect was in perfect condition, and had evidently just emerged from the pupa. It had probably been imported in some cases of "Verdelli" lemons, about two hundred packages of which were in the stores at the time of its capture. It was subsequently identified by Mr. L. B. Prout, F.E.S.

Pachys (Amphidasys) betularia ab. doubledayaria in Essex.—Referring to the communications from the Rev. W. Claxton in the 'Entomologist' for July last (p. 204), and from Mr. W. H. Harwood in this month's issue (p. 228), with regard to the capture of the above insect, I may say that I have taken ab. *doubledayaria* in Essex on three occasions: once at Brentwood, June 2nd, 1907, and twice here at Westcliff-on-Sea, in June last. I think the probability is that wherever *P. betularia* occurs in this part of Essex you may also expect to find ab. *doubledayaria* occasionally. How much more abundant this variety would now appear to be than formerly! Some thirty-five years ago, and for some years after, I used to dig the pupæ (under elm-trees mostly) of *P. betularia* commonly at Tottenham, Wood Green, and other localities in the North of London. I have a good series of the specimens so obtained still in my collection; some are somewhat darker in their coloration than others, but there is nothing approaching the variety in question among them, indeed I never saw ab. *doubledayaria* alive until I met with it at Brentwood, as above mentioned.—G. H. Conquest; 10, Meteor Road, Westcliff-on-Sea, Essex, August 19th, 1910.

Collecting at Kendal (Westmorland), 1910.—Active work began on February 18th, for until this date the severe character of the winter prohibited collecting in any form. Our first visit to an oak wood after dark produced four specimens of *Hybernia leucophæaria* and one example of *Phigalia pedaria*, resting on the tree-trunks, whilst *H. rupicapraria* was found commonly sitting on the twigs of the hedgerows. Subsequent search with the lamp between this date and March 5th resulted in a fair series of both the first-named species, though neither ever occurred plentifully. The number of "crippled" *H. leucophæaria* was astonishing, and so also was the total lack of females. Careful examination of the oak-trunks, lower branches, and the grass round about the tree failed to discover a single specimen. In this wood, strongly banded male *P. pedaria* and black females are fairly numerous. *Hybernia marginaria* appeared early in March, and some beautiful smoky and banded forms of the male (evidently the progeny of a cross between one of the lighter forms and var. *fuscata*) were obtained by careful picking. The var. *fuscata* appears to be more plentiful each year. On the evening of March 22nd examination of the rose and adjacent bushes of the hedgerow produced *Anticlea badiata*, resting after flight on the prominent twigs. This species is pretty active, and one has to be ready with the net when attempting to pill-box it. On the same night young larvæ of *Noctua augur* were taken feeding on honeysuckle. A visit to a disused limestone quarry on the 23rd resulted in a few larvæ of *Agrotis lucernea*, all resting on the rock face, well away from the coarse grass on which the larva feeds. The local form of this insect is a dark and constant grey.

On March 25th I journeyed to the "Mosses," and there on the birches found *Asphalia flavicornis* in numbers, though the males were nearly all somewhat worn. With a single exception, all were resting on the slender upright stems of the dwarf bushes, and on the dark brown bark were easily seen. Several pairs *in cop.* were noted. Half a dozen pupæ of *Drepana falcataria* were discovered spun up in odd leaves that had braved the winter's blast and still remained attached to the trees. Sallows, on March 31st, were very productive of the commoner things. *Tæniocampa stabilis* fell to our shaking, literally in hundreds; *T. instabilis*, *gothica*, *cruda*, and *munda* in more moderate numbers. *T. leucographa* I did not see at all, though it is present in the district. April 8th found *Anticlea badiata* still fresh, and several male *Selenia bilunaria* (one exceptionally large and richly coloured) were taken resting, newly emerged, in the hedge bottom. A long succession of cold wet days and nights interfered sadly with April collecting, but on the night of the 19th the larvæ of *Gnophos obscurata* were found about half grown, feeding on wild thyme at the extreme edge of the limestone quarry. The most inaccessible situations are chosen by the larvæ of *G. obscurata* and *Agrotis lucernea*, for although the food of both grows luxuriantly on the level ground at the top of the rocks, it is only the isolated patches situated on the narrow ledges of the rock-face that appeal to these larvæ, and creeping about by lamplight with a drop of thirty or forty feet below is somewhat risky work. Towards the end of April, night-hunting in the hedgerows with an acetylene lamp (what a blessing these bright lights are to the entomologist!) gave an abundance of larvæ of *Triphæna fimbria*, *T. ianthina*, *T. comes*, *Noctua triangulum*, *N. brunnea*, *N. augur*, *N. baia*, and *Boarmia repandata*.

May 1st was a fine bright morning, and I was early on the "*carmelita*" ground; but several hours' careful trunk-hunting went unrewarded. This interesting species was discovered here, resting on the birch, in the year 1903, but we have had many a barren search since. Unfortunately, the small plantation of old birches, the original habitat, has been cut down, and the young trees growing in the vicinity either do not offer sufficient attractions to the moths as resting-places, or else the task of finding them thereon is a more difficult one. This year, larvæ of *Satyrus semele*, generally plentiful on the fine grass which clothes the rim of the quarries, was nowhere to be found. May 14th, a scorching day, was spent on a heather-covered eminence of some thousand feet elevation, close to the town of Kendal, a veritable paradise for the lepidopterist. Here, on the bilberry, *Thecla rubi* abounded, and a long series was obtained. The best time to take *T. rubi* is undoubtedly towards evening, when they rest on the top of the heather preparatory to descending for the night into the inner recesses of the bushes. Looking around, one may see hundreds basking in the last rays of the departing sun; and so quietly do they sit after the day's gambol, that a careful selection of the more perfect specimens is an easy matter. Ova were laid by several females on the leaves and stems of the bilberry, and the resulting larvæ, hatched in six days, were sleeved on the same plant until two-thirds grown, and then transferred to bramble. They took the latter food readily, but neglected the leaves for the unopened flower-buds, into which they burrowed after the manner of *Dianthœcia* larvæ. The same habit was noticed when on bilberry. The larvæ invariably sought out the seed capsule, entering it usually from the top, but sometimes boring through the side. I observed also that the upper and more succulent portion of the bilberry-stem was eaten readily. The most exciting feature of the day's sport was assembling with a newly emerged female *Saturnia pavonia*, which was found about midday at rest on the heather. About 5 p.m. she was placed on a prominent twig of heather and commenced calling almost immediately. From far and wide the amorous males responded, and we could have secured a hundred with ease. Helpless in their infatuation, they were readily caught without the aid of the net. After some time we allowed copulation to take place, but still more males crowded upon and completely covered the hapless couple; and even after the pair had been removed, the part of the bush where the female had been sitting proved equally attractive. *Ematurga atomaria* flew in abundance, and some nice banded females were secured. *Hadena glauca* and *Malanydris salicata* were both out, sitting on the alder-trunks, but we were a little early for *Acronycta menyanthidis*, which occurs here in quantity and nice variety. *Anticlea derivata* appeared on the 20th. It is not an early insect in this part of the country; I have never taken it before the 17th of May. On the 22nd a long series of perfectly fresh *Strenia clathrata* was obtained. A female *Pieris napi* with rich yellow under side, and a male *Pieris rapæ* with large discal spot, fell to the net on the 23rd. Dusking on the 24th resulted in a nice series of *Lampropteryx suffumata* with var. *piceata*.

In a fine open wood, abounding in oak, birch, sallow, alder, heather, and bilberry—an ideal hunting-ground and a favourite spot for sugaring—I found *Chrysophanus phlœas*, *Cœnonympha pamphilus*, *Euclidia mi*, and *Melanippe sociata*, all in excellent order, on May 26th, and on the same day beat larvæ of *Pseudoterpna pruinata* from the gorse. May was a grand month, nearly every day fine, and many of them gloriously hot, and by the end of the month our beautiful country looked luxuriant and attractive.

Things now began to move in the pupæ-cage. Each day saw emerging *Xylophasia rurea* with dark forms, *Amphidasys betularia*, *Odontopera bidentata*, and *Cidaria corylata*. Nearly all my *betularia* are var. *doubledayaria*, and all the larvæ were beaten from birch on the mosses, at least a dozen miles from any factory chimney! Var. *doubledayaria* is commoner here than the type, and so far from its sombre colour being a protection, it appears only to render it more conspicuous. I have frequently observed it resting in the daytime high up on the light limestone walls of the Kendal houses. Larvæ of *Geometra papilionaria*, beaten from birch last September, and wintered on cut birch twigs kept in a muslin-covered jam-jar outside (but protected from rain), were sleeved on a growing birch early in May, and pupated in the folds of the muslin on June 11th. Wherever possible, I sleeve all larvæ. Open-air treatment is the best preventive of disease. Baked in sunshine one day and nearly drowned with thunder-rain the next, my sleeved *papilionaria* stood the ordeal well, and fed up, pupated, and emerged early in July, in a most exemplary fashion.

Good sugaring was experienced on June 4th, captures including *Acronycta ligustri* and *A. rumicis*, both with acceptable dark forms, *A. psi*, *Hadena adusta* (dark), *H. thalassina*, and *Xylophasia rurea*. On the 10th *Melanippe tristata* and *Nemeophila plantaginis*, together with a dozen beautiful var. *hospita*, were taken close to the town. Var. *hospita* is certainly not confined to the mountain-tops. It occurs in several places near to Kendal, and at no great elevation.

On June 12th fresh *Polyommatus icarus* appeared, several males and one female being netted. Our local *icarus* are large and bright, and the females are well splashed with blue. Sugar on the 15th produced, in addition to species mentioned before, *Thyatira batis*, *Habrosyne derasa*, *Rusina tenebrosa* (some nearly black), *Triphæna pronuba*, *Hadena gemina*, *Agrotis exclamationis*, *A. corticea*, *Aplecta herbida*, *Miana strigilis* (in endless variety), *Noctua plecta*, *N. augur*, and *Euplexia lucipara*. *Venusia cambrica* was taken resting on the stem of a mountain-ash. Honeydew has been entirely absent this season, a condition that contributes no doubt largely to our success at sugar. No such numbers of moths have been seen on the patches since 1899.

On June 18th *Cœnonympha typhon* was plentiful on the mosses, but even on this date wanted "picking." *Aspilates strigillaria* occurred at the same time in nice order. Sugar on the 23rd was again successful, the feature of the night being the abundance and variety of *Aplecta herbida*. Some of them were really handsome insects, the vivid green of the fore wings contrasting with the nearly black hind wings in a pleasing manner. New species observed were *Aplecta nebulosa*, *Xylophasia polyodon* in great variety (brown forms common and an occasional one almost black), *X. lithoxylea*, *X. sublustris*, *Miana fasciuncula*, *Leucania comma*, and *L. impura*, *Noctua festiva* (very variable), *N. c-nigrum*, *Boarmia repandata*, *Abraxas sylvata* (both sipping the sweets), and last, but not least, one *Cossus ligniperda* (we had no pill-box big enough!).

In the pupæ-cage *Drepana falcataria*, *D. lacertinaria*, *Notodonta dromedarius*, and *N. camelina* continue to emerge in a desultory fashion. *N. dictæoides* (beaten from birch last September) appeared on July 2nd, another on the 16th, and I have more to come. I should say that only the earliest emergences of these species produce a second brood. June 6th saw the first of my *D. falcataria* out, and they are still emerging, July 17th. My pupæ are kept out of doors all the time, exposed to natural conditions of temperature, but are protected from rain. With some few exceptions they are never damped, beyond the placing of a wet cloth over the gauze-covered lid of the pupæ-cage during the period of emergence. This last may easily be a superfluous precaution, but at any rate it can do no harm.—FRANK LITTLEWOOD; 10, Aynam Road, Kendal, Westmorland.

SOCIETIES.

The South London Entomological and Natural History Society.—*July* 14*th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Scorer, of Chilworth, was elected a member.—There was a special exhibition of *Polyommatus icarus*.—Dr. Hodgson exhibited a large number of selected specimens, many of them being blue females and aberrant under sides.—Mr. R. Adkin, geographical series, the most striking of which were those from the West of Ireland.—Mr. Joy, long series of the spring and summer brood, illustrative of the seasonal dimorphism in size.—Mr. B. Adkin, some very fine examples from the Hebrides, Isles of Scilly, North Cornwall, Ireland, &c.—Mr. Kaye, selected examples from various localities.—Mr. Turner, a few aberrations in colour, including specimens from several Swiss localities.—Mrs. Hemmings, one or two remarkable aberrations, including a *thetis*-like male and an under side female, with the eye-spots showing extreme displacement.—Mr. Pickett, a drawer containing the results of many years' selection of forms. Mr. Tutt, in summing up the exhibit, considered it one of the finest and most complete ever got together, and stated that nowhere throughout its range was the species so extremely variable as in the British Isles.—Mr. R. Adkin, some bred examples of *Cyaniris argiolus* female, with much reduced borders.—Mr. Edwards, a box of exotic species of *Apatura*, *Adelpha*, and *Limenitis*.—Mr. Sich, specimens of *Prays curtisellus*, with var. *rustica*, from Westerham.—Mr. Pickett, an extremely fine bred series of *Angerona prunaria*, this year's result after twelve years' selection, crossing, and interbreeding. Many of the forms were extreme var. *pickettaria*.—Mr. Step read the report of the Delegates to the Guildford Congress of the South Eastern Union of Scientific Societies.—Hy. J. Turner, *Hon. Rep.. Secretary*.

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology, Vol. iv. No. 1. Issued by the Liverpool School of Tropical Medicine. June, 1910.

In this number there is but one purely entomological paper—"The Mosquitos of the Amazon Region" (R. Newstead and H. Wolferstan Thomas)—consisting of nine pages illustrated by one coloured plate. In the other articles insects are referred to only as they effect diseases, in which connection, however, their influence is very great. The number is beautifully printed, and amongst the illustrations are thirteen fine plates.—W. J. Lucas.

Errata.—Page 227, line 12, for "Eye" read "Ely"; line 17, for "*Baccalatrix*" read "*Bucculatrix*."

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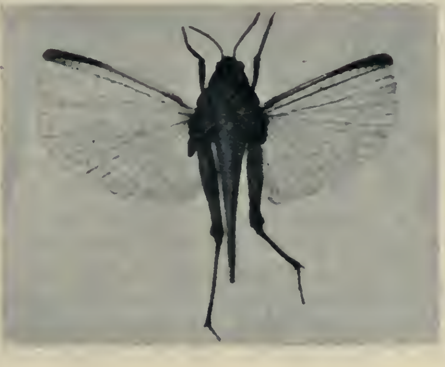
BRITISH ORTHOPTERA IN 1909.

By W. J. Lucas, B.A., F.E.S.



W. J. Lucas, photo.

Tetrix subulatus, with wings expanded (× 3·25).

Nothing of first-rate importance seems to have been noted in connection with the British Orthoptera during the season of 1909; but the following short notes may nevertheless be of interest.

Forficulodea.—On August 3rd, in one of its known localities near Christchurch, Hants, I found three examples of *Labidura riparia*—two females and a poorly developed male, with callipers of a not very pronounced type. A pair I retained for observation, and noticed on the morning of August 10th that the female had eaten the greater part of the male. On December 24th Commander J. J. Walker gave me a fine pair of *Anisolabis annulipes*, taken at Queenborough on August 17th. It seems that both this species and *Labia arachidis* are found in this locality, not only indoors, but also in the open amongst old sacks. As, however, these sacks are to some extent decomposing, there is perhaps a temperature above the normal, just as there would be in a manure heap. *A. annulipes* is common out of doors, whereas *L. arachidis* is more common in the works.

Blattodea.—*Ectobius lapponicus* was taken on July 15th in the Devil's Punch-bowl, at Hindhead, Surrey. On July 30th, at Aldridge Hill, in the New Forest, I captured a male of the same species, which readily took to flight, this being, I believe, the first time I had seen a cockroach of any kind upon the wing. On Beaulieu Heath, in the New Forest, a female *Ectobius panzeri* was taken on September 1st, carrying its ootheca. The wings of this species are rudimentary in the mature female, so there is nothing out-of-the-way in a short-winged insect, as was this one, possessing an ootheca. On September 29th I received from Kew Gardens a mature example of *Pycnoscelus surinamensis*, which was remarkable for its very small size.

Locustodea.—On July 7th I received from Mr. J. R. le B. Tomlin a "long-horned" grasshopper caught just previously at Streatley, Berks. It was probably a nymph of *Phasgonura viridissima*. When put in a breeding-cage it commenced to crawl up the vertical surface of the glass front, and repeatedly put its tarsi into its mouth, for all the world as if it was making them wet so that they might cling to the glass the better. A mayfly put into the same cage to mature was found afterwards to have its head much damaged, presumably having been attacked by the grasshopper, though whether the mayfly had previously died I cannot say. On September 3rd two females of *Metrioptera albopunctata* (= *grisea*), one of which had the dorsal surface of head and thorax rust-coloured, were taken at Chapman's Pool, Dorset. This species seems fond of a clayey sliding cliff-side, where its colouring assimilates well with that of the rough vegetation. On September 9th, near Claygate, Surrey, four specimens, including both sexes, of *Leptophyes punctatissima* were found on leaves of alder, some two or three feet from the ground, from which position they evinced very little desire to escape when the camera was brought into play. A female of *Pholidoptera griseo-aptera* (= *Thamnotrizon cinereus*) brought home from the New Forest at the beginning of September lived in captivity till October 6th.

Acridiodea.—*Gomphocerus maculatus* was the first grasshopper found mature, the date being June 15th and the place Oxshott, Surrey; a dark female was taken there on September 22nd. *Stauroderus bicolor* and *Chorthipphus parallelus*, which shewed much diversity of colour, were taken on September 3rd, at Chapman's Pool, on the Dorset coast; and both sexes of the latter were taken on September 19th, in Ashtead Woods, Surrey, where the specimens varied much in colour, one being very rosy. Several colour-forms of *S. bicolor* have received varietal names, but it would be hardly an exaggeration to say that scarcely two are exactly alike in colour. One feels certain, whatever may be the agency that brings about the result, that their colour, whenever the surroundings are sufficiently definite, assimilates—sometimes most accurately—to such surroundings. *C. parallelus* also varies much, but perhaps not so much as *S. bicolor*; on August 24th I took, in the New Forest, a green female with yellow-brown dorsal streak along thorax, elytra, and abdomen—this being a very striking form. The other British relatives of these two species do not appear to vary to the same extent, but perhaps this is because I have met with them in fewer localities, or the nature of their habitat is less varied. Of *G. maculatus* much the same may be said as of *S. bicolor*. On August 21st, near Holm Hill, in the New Forest, on dark soil which was not yet covered with vegetation after a fire, one or two very dark specimens of *G. maculatus* were noticed, while bright colours appeared to be absent; amongst heather, on the other hand, they are sometimes very prettily marked with crimson and green. *Gomphocerus rufus* is much more constant in the only locality in which I know it—Bookham Common, Surrey—where, moreover, it does not seem to be very plentiful.

In hot sunshine in the New Forest one hears much chirping. Is this always due to the wood cricket, *Nemobius sylvestris*, or is Tennyson incorrect, when he says:—

> "For now the noonday quiet holds the hill;
> The grasshopper is silent in the grass."

On August 6th *Mecostethus grossus* was taken in the New Forest, and appeared to be but just becoming mature. It was not easy to secure females whenever I was in search of this species, though males were plentiful enough.

Of the somewhat scarce grasshopper, *Tetrix subulatus*, Messrs. D. Sharp and C. G. Lamb took two pairs by sweeping, at Holmsley, in the New Forest, and the latter writes (*in litt.* Oct. 3, 1909): "We have run across both *T. bipunctatus* and *T. subulatus* here (Padstow, Cornwall), where they vary enormously in size. The figure depicts one of Mr. Lamb's specimens of *T. subulatus* (× 3·25) with wings expanded. Such ample wings are little suspected in so small an insect.

28, Knight's Park, Kingston-on-Thames.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 216.)

There is a further point with regard to the genital armature to which it seems to me important to refer, because it is a case in which the defects are mechanical and well within the possibility of remedy. I allude to the utility (or in most cases the lack of it) of illustrations comparing the armature of different species with each other. A few weeks ago I should have said little or nothing on the subject, because I believed it to be impossible to produce anything which could be of practical value to those who had not made a long and very special study of the organs in question, and this in spite (or perhaps I should say because) of the fact that I had seen the reproductions, and in some cases the originals, of the photographs made by our most eminent and successful micro-photographers from the preparations of the most learned and painstaking of our microscopists who have specialized in this direction. I have also in my possession the original photographs taken by M. Jullien, of Geneva, from his own preparations of the genitalia of this group of the Melitæas, three of which were shown at the first exhibition of the Geneva Lepidopterological Society to illustrate the connection between *athalia*, *deione*, and *berisalensis*. All these are far too complicated, in my opinion, to be of any considerable value to the average entomologist who, without being a specialist, is anxious to have a general working knowledge of all parts of his subject so far as possible. Now, I am perfectly well aware that my opinion as an individual has no particular value, but it is just because I am not a specialist in this direction that I dare to put forward a claim to speak on behalf of those who, like myself, are merely interested students of fairly average intelligence, and who have managed to reach a somewhat higher entomological level than that of the very unduly despised "mere collector." I would say, then, that the following points are essential if such illustrations are to be of value to any but the advanced specialist:—(1) They must all be in the same position, and if in profile must be turned in the same direction; (2) the preparations must all be made by the same person, for practically no two people make their preparations quite alike; (3) they must all be magnified to the same degree, and it will conduce to further clearness if the photographs are all by the same photographer. This, until recently, was the utmost that I thought might be hoped for, but far more has now been accomplished. In the 'Bulletin de la Société Lépidoptérologique de Genève,' published this summer, Dr. Reverdin's and M. Charles Lacreuze's illustrations of the genitalia of the Hesperids show how absolutely intelligible such reproductions can be made in two different ways. Not only have all the above points been carefully attended to, but in both cases the armature, given in profile, is presented with one side removed, so that only the essential structure is shown without any unnecessary complications. The illustrations to Dr. Reverdin's paper are reproductions of carefully finished micro-photographs, those to M. Lacreuze's are much more diagrammatic. For most purposes, indeed, it seems to me that the more diagrammatic the illustrations the more generally useful they will be found, and personally I have learnt more from the pencil sketches drawn by Mr. Heron, partly for his own guidance and partly for my information, than from all the complicated illustrations that I have ever seen. A further advantage that the new Geneva preparations have over M. Jullien's and the usual English split and spread forms is that they are presented as nearly as possible in the natural position. Details of structure are best compared by means of microphotographs of the separate parts, the greatest care, of course, being again necessary to present them for comparison in exactly the same position; this also is to some extent provided for in the illustrations to Dr. Reverdin's paper. No such illustrations, however, exist as yet, so far as I am aware, of the group now under consideration, and the very incomplete information which I have been able to get together has been drawn from various sources of varying degrees of trustworthiness, so that I feel it impossible for the present to go into details on the matter, and merely regard the few following notes as suggestions which may very possibly require further modification. In some respects, at any rate, the armature of *M. asteria* supports the theory that this is the oldest form of this group, some details appearing to be modified from it in some species, and others in others; *M. parthenie* comes nearer to it than *M. athalia*, a fact that did not surprise me, as I had concluded on other grounds that it was probably the older form; *M. deione*, contrary to expectation, is apparently nearer to *M. athalia* than to *M. parthenie*; *M. varia* adds to the otherwise extreme probability of its specific distinctness from *M. parthenie*, and possibly may be held to support its nearness to *M. aurelia*. The identity of *M. dictynnoides* in this respect with *M. aurelia* seems to indicate a less recent date for the former species than Hormuzaki has supposed on other, and in my opinion probably sufficient, grounds, to which I must refer again; the identity, again, of *M. britomartis* (from Reazzino) with *M. dictynna* certainly shows the close relationship between the two, though I have previously given reasons which still appear to me sufficient to place their specific distinctness beyond question; it would also seem to indicate a greater distance between *M. athalia* and *M. britomartis* than might otherwise have been expected; and, lastly, the comparative anatomy in this respect of *M. deione* var. *berisalensis* gives some slight support to the theory that the latter is a distinct species, and is perhaps an indication that it is at any rate on its way to becoming so; though, comparing the two with *M. athalia*, it would probably be truer to derive *M. deione* from *M. berisalensis* than the latter from the former, a theory to which their geographical distribution certainly lends support. I must, however, be allowed to repeat that the second-hand material at my disposal is drawn from sources too varied to make comparisons very certain, and to add that I dare not as yet put any reliance on first-hand investigations in a matter in which my experience is still so slight; and, indeed, it is mostly for the sake of *obiter dicta*, and with the hope of throwing out suggestions on which more competent seekers may work, that I have thought it worth while to enter on this part of the subject at all.

(To be continued.)

SOME VERY SMALL AUSTRALIAN BEES.

By T. D. A. Cockerell.

In the vicinity of Mackay, Queensland, in March, 1900, Messrs. Gilbert and Rowland Turner obtained three species of very small bees at the flowers of *Eucalyptus*. They are all of the *Euryglossa* type, but two of them are so peculiar in their venation that they must be assigned to new genera. The smallest of the three is only a little over 2½ mm. long, and is smaller than any bee previously made known.*

Turnerella, n. gen.

Minute bees allied to *Euryglossa*, but with only one submarginal cell and two discoidals; marginal cell sharply pointed on costa; stigma large; section of basal nervure bounding first discoidal cell strongly arched; claws bidentate; base of mandible making an angle of about 45° with base of eye, so that the malar space cannot be defined as in most bees.

Turnerella gilberti, n. sp.

♂. Length about 2550 μ; head and thorax shining dark sepia brown; clypeus and mandibles (except apex) dull yellow; legs pale brownish yellow, anterior pair orange; abdomen shining, the basal half pale reddish brown, the apical much darker; mesothorax minutely tessellate, with scattered very feeble hair-punctures; front and vertex sculptured like mesothorax; abdomen microscopically transversely lineolate; eyes coarsely facetted; ocelli large; facial foveæ represented by very short grooves, about 35 μ long; antennæ placed close together; scape very short; flagellum thick, long-claviform, minutely hairy; second antennal joint very large, oval, third very minute; mandibles bidentate; scanty plumose hairs on face; hairs at end of abdomen with about three short branches, all on one side. Wings clear hyaline, minutely hairy, stigma large, dilute brownish; marginal cell sharply pointed on costa, about 510 long (all the wing measurements of this and the other species are in microns); depth of stigma about 100; submarginal cell about 290 long, more than twice as long as high; basal nervure falling about 50 short of transversomedial, which is vertical; recurrent nervure to transversocubital about 35.

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* *Turnerella gilberti* is not the smallest bee. Since writing the above I have noted that *Trigona duckei*, Friese, from Brazil, is only 2 mm. long. It may perhaps exceed *T. gilberti* in bulk, however.

Named after Gilbert Turner, who collected so many new insects in Queensland.*

Type in British Museum.

EURYGLOSSELLA, n. gen.

Small bees allied to *Euryglossa*, but with only one submarginal cell and one (the first) discoidal; the basal nervure ends a long way from the transversomedial, and its lower section is hardly arched; claws bidentate, pulvillus very large.

Euryglossella minima, n. sp.

♀. Length about 3½ mm.; head and thorax black or brown-black, shining; clypeus and mandibles (except apex) dull rufofulvous; antennæ dark above, pale fulvous beneath; face broad, eyes slightly converging below; foveæ linear, short, close to eye; base of mandible makes an angle of about 50° with base of eye; clypeus very broad and low, its straight upper margin about 290 μ long, the lower about 620; labrum with a pair of nodules; scape rather long (about 255 μ); second antennal joint large, pyriform, third minute; flagellum short and thick, minutely hairy; femora, except knees, very dark brown; middle and hind tibiæ dark brown, pale reddish at base and apex, anterior tibiæ fulvous; tarsi pallid, slightly yellowish; small joints of anterior tarsi, and apices of their basitarsi, with curious hooked bristles; mesothorax, front and vertex microscopically tessellate; abdomen shining, practically hairless, dark brown with a slight purple lustre; wings clear hyaline, iridescent, the large stigma (its depth rather over 100) margined with brown; marginal cell 425 long, sharply pointed on costa, deep for its length; submarginal cell from lower basal to upper apical corner 340; discoidal measured in the same way 270; basal nervure ending 150 from transversomedial.

Euryglossa perpusilla, n. sp.

♀. Length about 3½ mm.; head and thorax shining black, abdomen dark reddish, with a strong purple lustre, and without evident hair; antennæ fuscous above, pale below; legs clear pale yellow, middle tibiæ mainly fuscous behind; hind tibiæ fuscous behind, pale ferruginous in front, their tarsi pale ferruginous; eyes very strongly converging below; clypeus about 230 μ across at top, and 275 below (the shape thus entirely different from that of *Euryglossella*), wholly dark, with sparse punctures; supraclypeal area with a broad transverse orange band, bounding lower suture; mandibles set at an angle of about 50° with base of eye; last joint of maxillary palpi 75 μ, as long as the two before put together; ocelli large; facial foveæ linear grooves, about 190 μ long; antennæ formed essentially as in *Euryglossella*, the flagellum very minutely bristly; second joint pyriform; joints three to eleven broader than long; sculpture of head, thorax, and abdomen as in *Euryglossella*; claws simple (bidentate in *Euryglossella*), pulvillus large; thick curved bristles on small joints of anterior tarsi; hind spurs orange, thick, spinulose, or denticulate on both margins; two submarginal and three discoidal cells; marginal cell like that of *Euryglossella*, about 510 long; first submarginal 410 long; second submarginal 120 long below and 90 above, its depth about 70; first recurrent nervure to first transversocubital 35; second recurrent reaching apical corner of second submarginal; basal nervure on first discoidal strongly arched; length of first discoidal 425; basal nervure falling about 70 short of transversomedial.

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* Mr. Rowland Turner kindly gives me the following information about his brother:—"He was resident at Mackay from 1883 to 1901 with me, and made a very large collection. We afterwards did a season's collecting at Cairns, after which I went to Cape York and Assam, while he went round by Cooktown and Port Darwin, but caught cold at Hongkong, and died of rapid consumption after joining me at Assam in 1903. It had been his intention to return to England and work up his collection, probably beginning with the bees."

Very near to *E. semipurpurea*, Ckll., but smaller, with differently coloured legs, &c.

BRITISH ODONATA IN 1909.

By W. J. Lucas, B.A., F.E.S.

But little of interest in connection with the British Odonata came to my notice in 1909. The season certainly commenced early, for specimens of *Pyrrhosoma nymphula* were secured by Mr. B. Piffard near Brockenhurst, in the New Forest, as early as April 22nd. I have no further record, however, till May 8th, when *Libellula quadrimaculata*, in teneral condition, was taken at the Black Pond on Esher Common, Surrey. At the same place on the following day it was taken again with *P. nymphula*, *Enallagma cyathigerum*, and one female *Cordulia ænea*, all being more or less teneral. Of these *P. nymphula* was commonest and most mature. On May 22nd a female *Libellula depressa* was taken at Oxshott in the same district of Surrey.

Between Byfleet and Wisley, in Surrey, on the following day, *Calopteryx splendens*, *Erythromma naias*, *P. nymphula*, *Ischnura elegans*, *Agrion pulchellum*, *A. puella*, and *E. cyathigerum* at least were on the wing; but many were in teneral condition. On this occasion a female *C. splendens* was secured with its captured prey—a mayfly, *Ephemera vulgata*, which appeared to be in the sub-imago stage.

Two days spent in the New Forest (May 30th–31st) brought to notice *Orthetrum cærulescens* just emerging, a fair number of *Calopteryx virgo*, *P. nymphula* in plenty, and *A. puella*. On a visit to Bookham Common, in Surrey (June 9th), *I. elegans* alone was noted. On June 13th a female *Pyrrhosoma tenellum* was taken at the Black Pond, where also *L. quadrimaculata* was common, and a *C. ænea* was secured by Mr. Fenwick, junior. My first

Anax imperator was sighted on this day in the same neighbourhood. On July 23rd, *Sympetrum striolatum* and *Æschna grandis* were met with at the North Downs near Albury.

During a stay in the New Forest from July 30th to September 7th there were seen:—*P. tenellum*, with its var. *erythrogastrum*, *O. cærulescens*, *Platycnemis pennipes*, *P. nymphula*, *I. elegans*, *Sympetrum scoticum*, *Lestes sponsa*, *S. striolatum*, *C. virgo*, *Cordulegaster annulatus*, *Agrion mercuriale*, *L. depressa* (August 8th), *E. cyathigerum*, *A. puella*, *Æschna mixta*, *A. imperator*. The date, August 8th, for *L. depressa* is a late one for the species. *A. mercuriale* was found to have a more extended range along Oberwater Stream than was previously supposed.

My last record for the season was *S. striolatum*, *S. scoticum*, *Æschna juncea*, *Æ. grandis* and *E. cyathigerum* at the Black Pond on September 12th.

I should add that I received *C. splendens*, taken at Alice Holt Wood on June 13th by M. Warriner, *E. cyathigerum* from Nethy Bridge in July (D. Sharp), and a note of *Æ. mixta* taken by F. Enock in a garden in Tufnell Park Road, London, about 9.20 a.m. on August 21st. Whence did the last come, as Mr. Enock had not himself bred a nymph during the season?

28, Knight's Park, Kingston-on-Thames.

NOTES ON THE VARIETIES OF *PERONEA CRISTANA* LATELY IN THE COLLECTION OF THE LATE MR. J. A. CLARK.

By Sydney Webb.

(Continued from p. 201.)

Cristana Group.

a. *Button conspicuous.*

Fore wing unicolorous brown to black, with white, brown, or cream-coloured button, and pure white or cream vitta.

Cristana, Fab. nec Dup. — [Is too well known to require notice. Distinguished by its snow-white button and vitta. It would appear that the ground colour of the wings is at the present day becoming darker than formerly.]

Nigrocristana, Clk.—Readily separated from the last by the central tuft of scales being black, brown, or rusty brown, although Clark mentions black only. There are no subsidiary small tufts of white scales. This form appears to be in almost every collection mixed with the last.

Fuscana, Clk.—Is identical with *nigrocristana*, but slightly lighter in hue. His type specimen does not agree with his named series, and the central tuft instead of being very large is almost wanting, whilst a red line from the tuft to the costa near the apex is very noticeable. Not one of his series of six shows this red line, and the disc of their wings is in each case unicolorous light brown, vitta pure white, and the central tuft large and rust-coloured. This new name had better be dropped.

[*Albipunctana*, Steph.—A well-known and well-described form, but the central tuft is rarely white, owing to cream scales being intermixed, which make it appear white in some lights only, and distinctly cream in others. At other times the ground colour is darker, nearly black on the costa, and one specimen in the writer's series is very like *semiustana*, with white tuft and vitta.]

Ochreapunctana, Clk.—Similar to *albipunctana*, Steph., but button more decidedly yellow, and vitta distinctly ochreous.

Proxanthovittana, Clk. = *xanthovittana*, Desv.—Desvignes' description is curt; he says it is like *unicolorana* and *alboflammana*, with a yellow dash or vitta, but it is not like *unicolorana*, inasmuch as that form is entirely without vitta, and it is not like *alboflammana*, Curt., for that form has a broad white vitta. It must then have some other character possessed in common with them other than a vitta, or they would not have been classed together by him. Looking for this feature in common, we at once see it to be the absence of the central tuft—the very point of distinction that Clark claims for his var. *proxanthovittana*. By the law of priority Clark's name must then sink in favour of *xanthovittana*, Desv., but we may transfer it to the similarly coloured brown-tufted insect, which has long stood in a mixed series in our cabinets under the name "*xanthovittana*."

B. *Button wanting or extremely small.*

[*Alboflammana*, Curt.—Unicolorous light to dark brown, button entirely wanting, vitta snow-white.] A well-known variety.

Subalboflammana, Clk.—Unicolorous pale brown, with snow-white vitta, button only represented by a white dot.

[*Unicolorana*, Desv.—Ground colour as last, but no button and no vitta.]

Subunicolorana, Clk.—Differs from *unicolorana*, Desv., by conspicuous large dark button. From its large button this obviously should not be placed here; yet only differing as it does from the last in this respect, I have reluctantly included it. It seems impossible to graduate the varieties of *cristana* in any satisfactory sequence, and collectors would do well to observe Desvignes' plan, and arrange them as much as possible in groups, rather than according to their own individual pleasure.

c. *Vitta confined to base of inner margin only.*

Subvittana, Steph.—Well known to all collectors.

Punctana, Clk.—Ground colour darker, and button and short vitta more cream-coloured; small pale scales more numerous, two on disc before tuft, four along inner fold, several along costal fold, and others towards the end of the wing, giving a very speckled appearance to the insect. But these minor additions scarcely seem to warrant a distinctive name variety.

Nigrosubvittana, Clk. — Blacker ground colour. The short pale vitta more obsolete, pale grey rather than white; central tuft black.

NIGRANA GROUP.

Ground colour black.

This phase of aberration in *P. cristana* seems quite a modern development. The form first appeared in the New Forest a year or two earlier than 1890, and we saw only one of the form among a series of nearly two hundred specimens examined in the following year. The commonest varieties at that time were *cristalana, striana*, and *defontainana*, with some of the unicolorous brown examples. Now it is equally common with all of these, and at Epping it is easily first among the scarcer aberrations. Black, with a shining surface and unicolorous, excepting for the deeper blue-black of the markings, button, and tufts; it is well-named and unmistakable, but after all is only an intensified form of *profanana*.

Rufinigrana, Clk.—A distinction without a difference. Of this form Clark remarks: "The chocolate-coloured marking, which is totally absent in *nigrana*, constitutes the difference." Possessing both the type (quite unlike the figure) and his series, we are forced to say there is no chocolate line whatever as described. The main difference is that in this the darker black curved line from the black tuft, which terminates upon the disc in *nigrana*, becomes in *rufinigrana* a straight line to the costa near the apex; whilst in certain lights we see a reddish blush over the black scaling of the wings between the base and the tuft, but this is not sufficiently pronounced to be esteemed a difference such as ought to be recognized by a varietal name. Moreover, the specimen chosen for description and figuring differs *per se* from Clark's own assorted series, being paler in colour generally, and brown-red near the body. The name *rufinigrana* as one of non-importance should be dropped altogether.

Jansoniana, ab. nov.—Another of the *nigrana* group, all of which are absolutely identical in depth of colour, is distinguished by the dark grey head and thorax, and reddish grey vitta always distinct, and never degenerating into the several pale lines we see in *striana*. Mr. Clark had eight of these, and we propose for this rather striking form the above name, after Mr. Oliver E.

Janson, who accompanied him in many of his excursions, and introduced him to the locality where these *nigrana* varieties were mostly captured.

Merlana, Clk.—His description is sufficient to identify this. The head and thorax is more ash-coloured than the last, whilst the *striana*-like lines on the inner margin are quite unlike the consistent unicolorous band which distinguishes *Jansonana*.

Atrana, Clk.—A good variety. The author's description of the vitta as orange-coloured scarcely, however, hits the mark, as it is difficult to give a colour term to it; really it is scarlet, with a yellow margin either side, a combination that makes the general aspect of the vitta much richer in colour than the term which is expressed by orange.

Albonigrana, Clk., does not belong to this group, but to that of *ruficostana*, whilst *nigroruficostana* (*nigrocostana*), Clk., is only a very black *nigrocristana*. Neither would be mentioned here but for the names, which are misleading. By some extraordinary blunder, Clark's plate, showing these aberrations, has the names and figures reversed.

RUFICOSTANA GROUP.

Upper part of wing rich rufous brown. Button wanting or extremely small.

Curtis says of the type of *ruficostana*, "inner margin white," but Clark, "that the true *ruficostana* is yellow." Which is correct? If Curtis stands, *alboruficostana*, Clk., must fall. But for many years that with the white vitta has been in our cabinets as the typical form. The description must stand before any plate.

Ruficristana, Johnson.—He describes this as precisely similar to *ruficostana*, Curt., of which he says his (Curtis's) description would do for the two, but there is a very small red tuft in *ruficristana*, John., which is absent in Curtis's moth, and it is very seldom seen. Our authorities have been right in sinking this name.

Attaliana.—Clark says it is the only aberration in this lovely group of four which has the white dots on the superior wings in the marginal area; and inasmuch as Clark had but two specimens, and one of these he made his type, whilst the other has no white dots on the superior wings, it must be left to our readers whether or not a varietal name should be admitted for a single example.

Transversana, Clk.—Well-founded and distinct, without any vitta; altogether a dull-looking insect, of which there are several in cabinets, but not hitherto differentiated.

Albonigrana, Clk.—Wings deep slate-coloured, the upper third of the wing velvety black, vitta pure white; a chaste and beautiful form.

(To be continued.)

NOTES ON SOME HUNGARIAN AND AUSTRIAN BUTTERFLIES IN 1910.

By W. G. Sheldon, F.E.S.

A family holiday, spent wandering in various countries south-east of these islands, enable me to pen a few notes on certain Diurni observed there.

We arrived at Budapest on May 10th, and the following day visited Svab-hegy. The day was not very favourable, with but little sun and a good deal of wind, consequently butterflies were not abundant. *Pyrgus orbifer* was, however, well out, and in perfect condition, flying with plenty of *Hesperia malvæ*; males of *Polyommatus baton* were not infrequent, and one example of *P. orion* var. *ornata* was observed but not netted. Here and there *Papilio podalirius* sailed along in its inimitable manner; *Leptosia sinapis* was frequent.

Herculesbad and the Cserna Gorge from the "Weisses Kreuze" Wood.

On the morning of May 12th I visited the Promontor Marshes with Professor Schmidt, chiefly with the view of obtaining a series of *Chrysophanus thersamon*. It was a very pleasant experience—after last year's June visits to these marshes, which resulted in a few battered specimens only—to net in a short hour twenty-three fine examples, the sexes being about equally represented; a solitary *C. rutilus* male seemed about the first emergence of his generation. I was fortunate to add a not very good male *Colias chrysotheme* to my list, the first time I had seen this species; *Papilio machaon* was frequent, with at least one var. *aurantiaca*; plenty of *Pontia daplidice* var. *bellidice*; some *Chrysophanus dorilis*; and a few *Melitæa cinxia* completed my list of species other than those of universal distribution.

Proceeding towards the lower reaches of the Danube, the train stopped for half an hour some twenty miles north of Temesvar, and enabled me, in not a very happy frame of mind, to watch the gambols of a pair of *Colias myrmidione* on the railway bank, in apparently perfect condition, for I had searched for this species long, and so far unsuccessfully, and to see it for the first time under these conditions was distinctly tantalizing.

That portion of the Danube gorge between Bazias and Orsova impressed me as being good ground, with plenty of well-wooded transverse ravines, and one passes several villages on the Hungarian side of the river where accommodation might be obtained.

I reached Herculesbad on May 18th, and was favoured with four practically cloudless days. It has often impressed me that one of the most charming aspects of the study of European butterflies is that it almost invariably takes one into such exquisite surroundings; and that the best localities for butterflies are usually those of the greatest scenic beauty. Albarracin, Berisal, Zermatt, Ronda, Granada, and the "Côte d'Azur," amongst others, each in its way are amongst the fairest spots in Europe; and they have all produced for me, at different times, shoals of butterflies, many interesting and beautiful species hardly to be met with elsewhere.

Herculesbad can take its place with any of these, and just at the period of my visit it was looking its very best. The luxuriant woods clothing the sides of the great gorge, except where these are sheer rock and precipice, were in the vivid and varied green of late spring, and the air was laden with the perfume of blossom of tree, shrub, and plant. Prominent amongst these was the wild lilac; these regions are the home of that exquisite shrub, and the mountains round, when the woods are not too dense, are thickly overgrown with it. Another noticeable tree was a species of ash with large trusses of odorous cream-coloured flowers, and one tree was sufficient to scent the air for many yards around. Altogether I do not remember ever wandering in more delightful woods.

Driving from Orsova, a distance of twenty-seven kilomètres, we did not reach Herculesbad much before noon, and with unpacking and lunch, I was not fairly started on my way up the Cserna before two o'clock, too late on most occasions for much hope of meeting with many butterflies. On this day, however, I was in luck; the day previous there had evidently been a heavy fall of rain, and the road was still damp, with puddles in places; at most of these, *Neptis aceris*, in twos and threes, in most perfect condition, was drinking. I selected my specimens, for *N. aceris*, even when newly emerged, is apt to be chipped or rubbed, but, after allowing for rejections, by four o'clock I mustered thirty perfect in all respects. Last year, a month later, I had to work hard for a whole morning to get half a dozen battered examples.

Last year I recorded in 'Entomologist' (xlii. p. 274) certain specimens of *Pieris rapæ* from Herculesbad. After considerable trouble I find, thanks to the Rev. G. Wheeler, that these are not *Pieris rapæ*, but *P. manni* var. *rossii*. They impressed me at the time of capture as something different from any forms of *P. rapæ* I had ever seen, but I could not then identify them as anything else. *P. manni* is at Herculesbad, as I understand is the case elsewhere, purely a woodland species, feeding, no doubt, on one or more of the numerous Cruciferæ which abound amongst the undergrowth. It is most abundant at the level of the road, but one or two specimens were netted at an altitude of quite one thousand feet above it. The spring brood was well out at the time of my visit, but was not very abundant. The tips of the wings and spots are not so dark as those of the second brood, which are var. *rossii*. A fine form of *Leptosia sinapis*, with strongly marked under sides, was abundant at the puddles in the road. *Polyommatus orion* var. *ornata* was just emerging. *Nemeobius lucina*, very large and ranging up to 38 mm., flitted about the glades a mile or so above the Bad. The spring brood of *Pieris napi* was also abundant, the females much suffused on the upper sides with grey; and amongst other species observed in the Cserna Valley were *Papilio podalirius*, *Cyaniris argiolus*, and *Pararge egeria* var. *egerides*; all of them frequent.

A visit to the Coronini the next day, May 17th, was not remarkable for the number of specimens seen or captured. Amongst other species, *Melitæa cinxia*, with the tawny form of the male usual in South Europe, and a particularly fine female, with ground of wings pale straw colour, all the dark markings on upper side more pronounced than in the type, and a consequent reduction in area of ground colour. I find on comparing these with the series in the British Museum Collection that there are in it two examples taken in Bulgaria by Mr. H. J. Elwes, and labelled var. *obscurior*, Seitz, which resemble the Herculesbad form, except that in them the ground colour is somewhat whiter, and the dark markings more extended on the wing surface. I presume the Herculesbad form should therefore be called *intermedia*.

The only other things worthy of note taken on this day were a pair of *Chrysophanus thersamon* and an example of *Pyrgus orbifer*, in good condition, larger and darker than my Budapest specimens.

Last year, at the end of June, worn females of *Thecla acaciæ* were abundant flying round some blackthorn bushes, which, on my visit this year, I beat vigorously for larvæ; the only larva I succeeded in finding, however, came out as an imago of *T. pruni* on May 30th. Apparently the larvæ of *T. acaciæ* had pupated at the time of my visit.

Parnassius mnemosyne was abundant about a couple of miles up the Cserna Valley, at an altitude of about 300 ft., surely a very low elevation for this butterfly. The form was similar to that occurring at Budapest; that is to say, with small very dark spots. Fine large *Nomiades cyllarus*, with an expanse of 36 mm., were seen here and there, and the ubiquitous *Callophrys rubi* flitted about with occasional *Brenthis euphrosyne*, local and not common.

I made an observation that somewhat puzzles me. Last year, in one small dingle, and there only, I came across a few rather worn but unmistakable examples of *Everes alcetas* (*coretas*). This year, being six weeks earlier, I looked in this place for fresh specimens, and what I did get was three perfect male *Everes argiades*. I have been told that in Hungary these species, or forms of one species, are mixed up, and occur in the same localities, and my observation seems to confirm this view.

An ascent of the Domogled on May 19th was, from an entomological point of view, singularly barren. One would have expected to meet with *Erebia medusa* var. *psodea*, and other species; but with the exception of half a dozen specimens of *Papilio machaon*, the peak was entirely devoid of butterflies. On the way up, at the well-known Quelle, I netted a fine *Neptis aceris*, and saw plenty of *Pieris napi* and *Pararge egeria* var. *egerides*, and some *Euchloë cardamines*.

May 21st found me back in the Promontor Marshes. *Chrysophanus thersamon* was getting *passé*, quite seventy-five per cent. of those taken showing defects of one kind or another. *Plebius argus* was abundant and perfect, and a male of the fine Budapest form of *P. argyrognomon* was taken. I captured one *Melitæa trivia* by no means perfect. *Lycæna astrarche* was abundant.

We spent May 22nd at Szada on a visit to Baron Vecsey. The day was sunny, but butterflies were scarce. The Baron informed me they had been so all the season, and I have a much more vivid appreciation of the kind hospitality we received than of the specimens captured. Before lunch we took our nets and wandered through some very likely country; a few *Melitæa trivia*, *C. thersamon*, *Argynnis adippe* var. *cleodoxa*, *P. argyrognomon*, and *E. argiades* var. *polysperchon* were all we observed.

Journeying from Budapest to Vienna, an unfortunate breakdown in the health of one of my party necessitated a fortnight's stay at the latter place. During this period the only entomology I could manage was a few hours on May 31st at Mödling. Most of this time was spent in trying to get out of the long streets of the town into the country, which was unknown to me, consequently my time with the net was very limited, the event of the day being the capture of a splendid male of *C. myrmidone*, unexpectedly met with in a lane, too narrow for him to evade me, and netted before he realized his danger. The only other capture here worthy of note was a specimen of *Carterocephalus palæmon*. *Erebia medusa* was not infrequent.

The doctor at Vienna found that it was necessary for the invalid to go to a mountain resort for a time in order to recuperate. On June 7th we moved on to Semmering accordingly. Semmering is situated in the old Austrian Province of Styria, some seventy miles south-west of Vienna, and on the direct railway route from that place to Trieste, at an altitude of about 3000 ft., and as it is amongst the extreme eastern spurs of the Alps, I hoped to meet with some interesting butterflies; but in this respect I was considerably disappointed, though for what reason I do not quite understand.

The surroundings—a maze of valleys, woods, subalpine meadows ablaze with flowers, swamps, and levels of from 2000 ft. to 5000 ft.—seemed ideal ground for a June locality; but whether it was owing to a bad season, or some other cause, I never saw butterflies so scarce in Continental Europe. I was out each day from June 7th to June 19th, but my entire efforts could only account for thirty-one species, and the number seen of each species was in almost every case very few; so few, in fact, that it was no unusual event for me to spend a morning amongst ideal surroundings, and come back with half a dozen specimens.

The northern slope of the railway valley leading to Mürzzuschlag was perhaps the locality in which occurred the most specimens; pre-eminent in numbers amongst those was *Erebia medusa* of the *hippomedusa* form—the only *Erebia* seen at Semmering—and *Cupido minimus*, and both of these species, especially the latter, were in great numbers, and newly emerged at the commencement of my visit. With them *Nemeobius lucina* flitted about here and there, and *Hesperia malvæ* was common. Other species occurring in this valley were *Chrysophanus* *hippothoë* in the meadows; *Colias hyale*, frequent; *C. edusa*, one female observed; *Aporia cratægi*; and *Brenthis euphrosyne.*

Perhaps the best collecting-ground I found at Semmering was the cross valley leading out of the railway valley to the left, about a mile from Semmering, and known as the Durr Graben, or deer valley. The sides of this valley were clothed with woods of spruce and pine, and down the centre ran a small stream and a cart-road; alongside this, at intervals, were small clearings, and in these I found practically all the butterflies I cared to take. Prominent amongst them were *Pararge hiera*, which was not uncommon flitting by the side of the road; the specimens were in good condition, and I captured a good series of both sexes, and obtained ova, from which I have now larvæ feeding. With these occurred here and there *C. palæmon*, flying briskly about in the clearings, or drinking at the damp spots in the road. A rather fine form of *Pieris napi* var. *bryoniæ* was not infrequent, and from ova deposited by captured females I have now some three dozen pupæ. *P. egeria* var. *egerides* was abundant amongst the woods, and in good condition.

On June 18th I discovered a swamp on the east side of the Myrten Graben that contained a colony of *Cœnonympha typhon*, and also one of *Anthocera hippocrepidis*; in some of the examples of this latter species the sixth spot is well developed, in others it is barely indicated. *Melitæa athalia*, a form with the dark markings all very pronounced, became common generally; and amongst other species observed were *Papilio podalirius*, *P. machaon*, *Leptosia sinapis*, and *Nomiades semiargus*—none of them abundant. *P. mnemosyne* was plentiful at about 4000 ft., but did not apparently descend below this altitude.

Youlgreave, South Croydon: July 23rd, 1910.

REPORT ON A COLLECTION OF CULICIDÆ FROM COCHIN CHINA.

By H. F. Carter.

This collection, sent to Mr. F. V. Theobald by Dr. Broquet of the Pasteur Institute, Saigon, was found to contain a good variety of species, including a new one belonging to the genus *Stegomyia*. It would appear that the subfamily Anophelinæ is well represented, especially the genera *Myzomyia* and *Myzorhynchus*; and, further, that *Mansonia uniformis* is comparatively abundant.

Species found in the Collection.

Myzomyia rossii, Giles (1899), Journ. Trop. Med. (Oct. 1899).

Localities.—Five females, South Annam; five females, two males, Bien-hoa; one female, Giadink; one female, Ha-tien.

Myzomyia thorntonii, Ludlow (1904), Canad. Ento. p. 69 (1904).

Localities.—One female, Bien-hoa; four females, Ha-tien.

Myzomyia indefinata, Ludlow (1904), Canad. Ento. p. 299 (1904).

Localities.—One female, Saigon; one female, Ha-tien.

Myzorhynchus barbirostris, Van de Wulp (1884), Leyden Mus. Notes vi. p. 46 (1884).

Localities.—One female, Ha-tien; one female, Phu-My; six females, Tan-chau.

Myzorhynchus (sp?).

Localities.—One male and one female, Saigon; one female, Ha-tien.

These specimens appear to be near *M. vanus*, Walker, but have not yet been definitely placed.

Nyssorhynchus jamesii, Theobald (1901), Mono. Culicid. i. p. 134 (1901), Theobald.

Locality.—One female, Giadink.

Desvoidya obturbans, Walker (1860), Journ. Proc. Linn. Soc. Lond. iv. p. 91 (1860).

Locality.—One female, Giadink.

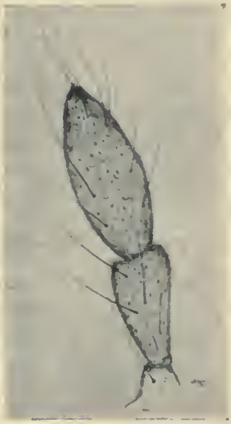
Stegomyia w-alba, Theobald (1905), Ann. Mus. Nat. Hung. iii. 74 (1905).

Locality.—One female, Ha-tien.

STEGOMYIA HATIENSIS, n. sp.

Head, thorax and abdomen dark, uniformly coloured. Palpi small and covered with dark scales. Legs almost black, unbanded.

♀. Head yellowish brown, covered mostly with dull blackish brown small flat scales; there is, however, a very small area in the centre line of the head composed of flat whitish scales and similar areas laterally; the former appears to be the remains of a median line of white scales; a row of nine black bristles project over the eyes, the three central ones being much longer and extending straight in front, the lateral ones curving towards the vertex; palpi blackish brown, three jointed, the apical joint the largest, with numerous small bristles; proboscis completely dark scaled; antennæ dark brown.



Female palp of *Stegomyia hatiensis*, n. sp.

Thorax with dark brown narrow curved scales; prothoracic lobes denuded of scales but with strong bristles; pleuræ also much rubbed, but small patches of flat white scales may be seen; bristles on the mesothorax chiefly at the wing-roots and projecting over the head; scutellum with a very marked median lobe, with scales similar to those covering the greater part of the head, border bristles missing; metanotum nude, dark brown.

Abdomen with blackish scales, unbanded.

Legs uniformly dark-coloured, with numerous small bristles; fore ungues equal and uniserrate, mid and hind pairs equal and simple.

Wings with typical *Stegomyia* venation, the veins clothed with dense brown scales; first submarginal cell longer than the second posterior, their bases almost level, the stem of the first submarginal rather more than half the length of the cell, that of the second posterior as long as the cell; the posterior cross-vein slightly more than its own length distant from the mid.

Halteres with light stems and dark knobs.

Length 3–3·5 mm.

Habitat.—One female, Saigon; four females, Ha-tien (Dr. Broquet).

Observations. — This description was drawn up from five females, all of which were in rather poor condition. It is a somewhat obscure species, and at first sight appears to belong to the genus *Verrallina* or *Skusea* rather than *Stegomyia*.

Note.—In two specimens the posterior cross-vein was practically twice its own length distant from the mid.

Stegomyia (sp. ?).

Localities.—One male, Giadink; one female, Ha-tien.

These specimens were both rather badly rubbed, but were most probably either *S. scutellaris*, Wlk., or *S. fasciata*, Fab. Dr. Broquet notes that one of them is "the common *Stegomyia* of Saigon."

Culex fatigans, Wiedmann (1828), Auss. 2 weit, Ins. p. 10 (1828).

Locality.—One male and one female, Giadink.

Culex impellens, Walker (1860), Proc. Linn. Soc. Lond. iv. 91 (1860).

Locality.—One female, Ha-tien.

Chrysoconops aurites, Theobald (1901), Mono. Culicid. ii. p. 209 (1901), Theobald.

Locality.—One female, Saigon.

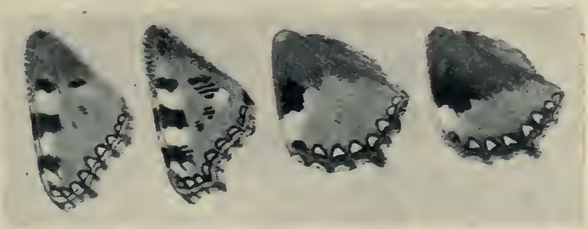
According to Dr. Broquet this species is apparently rare in Cochin China.

Mansonia uniformis, Theobald (1901), Mono. Culicid. ii. p. 180 (1901), Theobald.

Localites.—Six females, Ha-tien; four females, Tan-chau.

COMPARATIVE NOTES ON *V. URTICÆ*, L., VAR. *ICHNUSA*, BON., AND VAR. *TURCICA*, STAND. IS *V. URTICÆ*, L., THE "REDDEST" FORM AMONG ALL THE "TORTOISESHELL" VANESSIDÆ?

By T. Reuss.



1 2 1*a* 2*a*

After studying specimens of *V. urticæ* var. *ichnusa* from Corsica and Sardinia, and of var. *turcica* from Greece and Asia Minor for purposes of comparison with the more northern type and with the many aberrations of the latter, I venture to offer the following notes.

Upper sides:—1. Ground colour. In *V. urticæ* (*a*) pure or reddish orange, male and female; (*b*) brownish, yellowish orange (tawny), male and female. In var. *ichnusa* (*a*) pure or reddish orange (*male*, with slight puncta), *the same colour as in urticæ, type, and not redder*, mostly less red; (*b*) pure orange, brownish orange (tawny), male and female. In var. *turcica* the colour is the same as in *ichnusa*, female, the reddish tinge, to which *urticæ* tends so often, is less marked; in some specimens from Amasia, for instance, the colour is often dulled.

2. Yellow markings. In *urticæ* the well-known yellow spots are large, well-defined and light in colour, *standing in strong contrast with the ground colour.* In var. *ichnusa* the spots are reduced by the spread of the ground colour, and are more orange than yellow, thus lessening the contrast with the ground colour and enhancing the brightness of the latter. The var. *turcica* exhibits these markings as described for *ichnusa.* The inner marginal yellow spot is often quite obsolete in both varieties.

3. Outer margins. Var. *ichnusa*, female, differs often from the other forms by exhibiting a margin strikingly resembling that in *V. io* ab. *fischeri*, Stdfss.

4. Black markings. *V. urticæ* shows the black markings as in figs. 2, 2*a*; the lined markings in fig. 2 indicate which parts of the black spots fail to appear in var. *ichnusa*, male (with indications of puncta, but these are not in the position of the puncta in *urticæ*—they are farther removed from the wing-

margins), figs. 1, 1*a*. It will also be seen that the *outer part* of the inner marginal blotch of *urticæ* is "bitten off" in var. *ichnusa*. In var. *turcica* the black markings are in the identical position as in *urticæ*, and in specimens in which the puncta and inner marginal blotch tend to disappear, *they disintegrate exactly in the manner seen in aberrations of V. urticæ*—the inner marginal spot *first* in its *basal portion*—which is just the part that remains intact in *ichnusa*, so that the black spot in *turcica* falls partially in front of the same blotch in *ichnusa*. This is shown in fig. 2 by the lined and by the black portion of the spot in *urticæ*. The distribution of colour in the hind wing is intermediate in *turcica* between figs. 1*a* (an extreme form) and 2*a*.

5. Base of the fore wings. These parts are suffused with black and yellowish scales in all three forms, but, as the figures show, the basal and inner central area in *ichnusa* is covered as far as the first costal blotch; while in *urticæ* and var. *turcica* the basal parts show much of the ground colour as in fig. 2. The basal suffusion in *ichnusa* is quite unlike that in the American *V. milberti*, and must not be confounded with it. *Both* kinds of basal colouring appear in aberrations of *V. urticæ*. In *V. urticæ* var. *caschmirensis* the basal suffusion reaches as far as the inner marginal blotch, but does not cover the space before the first costal blotch.

Under sides:—6. As compared with Central European *urticæ*, these parts are of a somewhat richer brown in the two southern forms and the light area of the fore wings is conspicuously darker and warmer yellow in colour. British specimens of *V. urticæ* appear to be distinguished from most Central European forms and from the southern specimens by exhibiting much *black* (not brown-black) in the basal and median portions of the wings. These black markings often become very conspicuous and brilliant (ab. *subtus-nigra*), and the tendency to them makes it more difficult to obtain aberrations from British larvæ, which resemble *ichnusa-turcica* in their under sides, than from most Continental larvæ. Thus all my best aberrations from the latter larvæ—for instance, ab. *ioformis*, ab. *ioprotoformis*—exhibit rich *brown*-black under sides, with the lighter parts warm brownish yellow, as in var. *ichnusa* (it should also be here remembered that atavic forms of *V. io* show *brown* under sides and a tawny orange upper side—compare var. *geisha*, male and female, from Japan); while, with few exceptions, of which my ab. *subtus-puncta* (*antea* vol. xlii. p. 310) is a fair example, my aberrations from British larvæ exhibit *black* under sides tending to *grey*, instead of brown and yellow.* The ochreous, occasionally almost white (light greenish grey, violet-grey, yellowish grey) outer area of the under side hind wings in northern forms of *urticæ* is the effect of a tendency further distinguishing them from southern varieties. Extreme forms, which are very conspicuous and somewhat rare, could be distinguished as ab. *subtus-ochrea balteata*. I bred several fine examples of this form in July, 1909, from one particular brood of wild Herts larvæ under normal conditions, and the experience did not repeat itself since.

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* The Asian varieties *caschmirensis*, *chinensis*, *connexa* have *brown* under sides. The brown may in the large var. *chinensis* either cover the whole wing surface, as in the brown *V. io* var. *geisha*, or be restricted to the same wing parts as in *V. urticæ*.

The under side fore wing of the normal *ichnusa* is interesting for exhibiting conspicuously a row of light ochreous spots near the lunules of the fore wing. These markings correspond with similar spots in *V. io*; in *V. urticæ* they are less conspicuous than in *ichnusa*, while the American *milberti* female exhibits the full chain of these Vanessid spots.

If then *V. urticæ* and var. *turcica* clearly belong together, the facial relations of *urticæ-ichnusa*, on the other hand, would read as follows:—

Under sides:—In *V. urticæ* these wing parts are whitish, ochreous and black (greyish) or brown-black; in var. *ichnusa* warmer brownish yellow, brown-black.

Upper sides:—(*a*) In *ichnusa* the inner marginal blotch and median puncta (when these appear in the male) are not in the same position as in *urticæ*—they are farther removed from the outer margin, and also they are placed in a more slanting position, *i. e.* not in a line almost parallel to the margin as in *urticæ*. The marginal markings are different.

(*b*) The basal portion of the fore wings is covered with yellow and black scales (which together to the eye look *greenish*, a well-known effect of the two colours when so "mixed") right up to the first costal spot; while in *urticæ* these parts contain the richest and darkest portion of the ground colour.

(*c*) In *ichnusa* the light yellow markings of *urticæ* are darker and much reduced in size by the spread of the ground colour.

(*d*) The ground colour in *ichnusa* is much as in typical *urticæ*; the tendency to red is less in *ichnusa*, however. If *ichnusa* does *to the eye* appear more brilliantly coloured, more red than *urticæ*, then this effect is simply caused by the *greater unbroken expanse of one colour* in the median and outer area of the wings at the expense of other markings or colours. The "greenish" (black and yellow) basal wing area greatly assists in producing a brilliant colour-effect in the other wing parts.

To prove these points, which had puzzled me till at last I brought some specimens of *ichnusa* into my possession for direct comparison with my specimens of *urticæ*, I took two normal orange specimens of *urticæ*, and patched out the black markings of the right wing pair of one with pieces cut from the wings of the other specimen. The patches were put on as indicated in fig. 2 by the lined markings. Also the yellow inner marginal spot was covered by a piece of the ground colour. I found, however, that the colour-effect of *ichnusa* did not appear till I had, with the help of a light orange-yellow specimen of *urticæ*, also patched out the light yellow costal spots with the darker colour and filled in the basal wing part as in *ichnusa*. The hind wing was also made to look like fig. 1*a*, and then it was interesting to see how different in colour the two wing pairs, of which the left one had remained untouched *urticæ*, appeared to have become. The ground colour in the right wing pair was the same as in the left, yet it *looked* more fiery, more brilliant. Still, the shape of the wings, the less dentate outer margin, more "pointed" apical projection, and the peculiar arrangement of the blue spots disturbed the effect slightly; but the resemblance to *ichnusa* was sufficiently striking, and the alterations necessary to obtain this resemblance were great enough to show how hopelessly far from *ichnusa* were the aberrations of *urticæ*, which merely exhibited a reduction of the black and yellow markings. Not yet, as far as I could learn, have the black markings of *urticæ* aberrations appeared in the relative position they occupy in *ichnusa*. I will here note, however, that when in *V. io* the black inner marginal spot appears, as it occasionally does, then it occupies the same relative position in the wing as in *ichnusa*. I possess a few specimens of aberrative *V. urticæ*, which show this spot much as in *ichnusa*, but the puncta do not follow suit, nor does any other part of the facies, except the basal suffusion, do so. The corresponding parts of the under side in *urticæ* are *generally* nearer *ichnusa* than the upper side; this can be easily seen by holding the specimens against the light, when very often the inner marginal spot will be found to jut out far beyond the correlated black under side markings. The basal portions of the fore wings in *urticæ* cloud up occasionally under the influence of retarded pupal development (pupal aberration), or of retarded larval development, also if caused by *insufficient food* (larval aberration), exactly as in *ichnusa*. I have examples of both categories with the base like *ichnusa* (ab. *basi-ichnusa*—not to be mistaken for a dark form in which the wing base is much suffused with black and dark brown-red scales mostly extending to the median wing-area, as in *V. milberti*—ab. *basi-milberti**), but they are otherwise little different from normal *urticæ*.

In *different* aberrations of *V. urticæ* I also found most of the other *ichnusa*-form details, but I have not yet seen them all together in one specimen, and the important displacement of the median puncta has perhaps not yet been caused in *urticæ*, as also not yet the development of the margin of female *ichnusa*.

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* An extreme form of this fine aberration emerged last year, on the 25th of July, in my cases together with some transitional forms, from pupæ of *one brood of wild Herts larvæ, which developed under normal conditions* in the mean temperature of the season. I had expected to rear only normal specimens, which I wanted for purposes of comparison.

Altogether it appears that aberrations of *V. urticæ*, which are facially transitional to *ichnusa* (not merely to var. *turcica*), are very rare indeed, much rarer than such aberrations as ab. *atrebatensis*, ab. *ichnusoides* (a misleading name rather), *cærulapicata*, *ignea*, and others.

(To be continued.)

FIELD NOTES ON BRITISH SAWFLIES.

By Claude Morley, F.Z.S., &c.

(Continued from vol. xli. p. 192.)

The Selandriades comprise ten genera and fifty-three species, very many of which are extremely abundant everywhere, and among the first to be acquired by the collector. *Harpiphorus lepidus*, a very distinct insect, is, however, rare in my experience. I beat it from undergrowth in the Bentley Woods, near Ipswich, in the middle of May, 1897, and on April 22nd, 1901, discovered a larva in a cell, apparently of its own construction, in a gall of *Cynips kollari* on oak in the same locality. This larva became a green pupa on the 25th and remained green till May 11th, when the colour changed to yellow and black, those of the imago. It subsequently appeared to develop into its perfect condition in a curiously gradual manner. On May 12th the pupa could walk with a certain amount of ease, and during the same evening it was yet more active; on the 13th it had changed little in appearance, but was certainly an imago with legs, antennæ, and mouth-organs fully developed, though the wings remained somewhat immature. I still possess the larval skin, which is too shrivelled for description. Cameron (Phyt. Hym. i. 265) had no personal knowledge of the ecdysis of this species; but Fitch records (Entom. 1880, p. 258) four specimens bred from galls of the same species of Cynipid.

The Suffolk coast is especially cursed with *Athalia spinarum*, whence it has been recorded "in such numbers in July as to render the turnip crops leafless in August" (Ent. Ann. 1860, p. 91); crops were damaged at Hulver in 1838, and at Covehithe (Curt. Farm Ins. 59); Bloomfield found it commonly at Rendham about 1850; Smith, abundant at Lowestoft; Tuck, at Southwold and Aldeburgh—he noticed that the autumn brood consists mainly of males (Trans. Norf. Nat. Soc. 1902, p. 331). It has occurred to me mainly at Southwold in July, 1901, and I have never seen it out of the county (*cf.* McLachlan on its scarcity, E. M. M. 1901, p. 128). Singly it occurred at Tuddenham at the end of August, 1900, and at Claydon in the following

September. Of *A. lugens* I have recently made the acquaintance, in the person of a female, at Tuddenham Fen in the middle of last June, though Tuck took it at Southwold in August, 1900, and Chitty at Brandon early in June, 1903. *A. glabricollis* is doubtless often overlooked and mistaken for the next species, though Tuck has thrice found it in Finborough Park and Tostock in this county, and I took it at Brandon, Wherstead, and Tuddenham, Suffolk. Such quantities of *A. lineolata* are everywhere seen that it is only necessary to say that it has occurred to me in Cambs, Lincs, Hants, Isle of Wight, and is ubiquitous throughout Suffolk, where a single somewhat doubtful *A. scutellariæ* was swept in Tuddenham Fen on June 19th, 1901. *Selandria* has no common species, all are abundant or quite rare. My only *S. flavens* was captured by Alfred Beaumont towards the end of August, 1899, at Harting, in Sussex: *S. serva*, on the other hand, is to be seen everywhere throughout the summer months; and *S. stramineipes* is abundant in woods in Sussex, Isle of Wight, Suffolk, and the New Forest up to July 11th. *S. morio* appears confined to marshy situations, and is said to feed on willow; I have found it in the Norfolk and Suffolk Broads, the Isle of Wight and New Forest, mainly in June. *S. cinereipes* is much more local in my experience, being especially abundant at Brandon, where Chitty also took it in 1903, from June 3rd to August 12th; it has, too, turned up singly at Tuddenham and Barton Mills in the same district, and once near Ipswich on June 29th, 1895, by sweeping reeds at Bramford.

Fred. Smith is not the only author who has remarked (Ent. Ann. 1856, p. 100) upon the disparity of the sexes of *Strongylogaster cingulatus*: he regarded it as about a thousand to one, *i. e.* a single male "during a diligent search of twenty years"! But I have not found the female in the profusion he intimates, and the male has twice occurred to me in the Bentley Woods in May, as well as at Denny Wood in the New Forest, whence Miss Chawner has given it me. The only specimen of *S. xanthoceros* I have seen is that referred to by Mr. Morice (E. M. M. 1908, p. 192), captured by Rev. H. S. Gorham at Great Malvern. Of our four Thrinaces, I possess but a single *T. contigua*, taken by Beaumont at Blackheath on May 22nd, 1898. *Strombocerus delicatulus* is a beautiful species, by no means rare during June in woods by beating birch at Assington, oak (a pair) at Staverton in Suffolk, at Hursthill and Matley Bog in the New Forest. I have rarely met with *Eriocampa ovata*: near Ipswich in 1894; on *Heracleum sphondylium* flowers at Farnham, in Suffolk, on July 24th, 1899; and Elliott found it at Matley Bog on June 18th, 1907. Our ten species of *Pœcilostoma*—a correctly compounded word, whatever one surmise its author may have intended to convey—all appear to be of uncommon occurrence.

P. excisa and *P. liturata* are probably common, however, in the Norfolk Broads, where I took them in June, 1901; *P. abdominalis* has turned up singly at Matley Bog, Brandon Staunch, and in an elm-hedge at Southwold during June and July; once I swept *P. pulverata* towards the end of the former month at Foxhall, in Suffolk; *P. excisa* has also occurred in the Reydon and Henstead Marshes, near Southwold, on rushes during early June; and *P. liturata* at both Brandon and Wicken Fen in the course of the same month. *P. immersa* is rare, and I possess but a male from Barton Mills in Suffolk, and a female from Bentley Woods; a male of *P. longicornis* was swept at Henstead with *P. excisa* on June 2nd, 1905; and *P. tridens* turned up in the New Forest during May, 1895, and at Barnby Broad on July 15th, 1906.

Ten of our thirteen species of *Emphytus* are represented in my collection, and I believe the majority to be not uncommon, though *E. calceatus* is the only one I have met with in any numbers; this is frequent in the Norfolk and Suffolk Broads at Rockland, Oulton, and Barnby, and it also occurs at Brandon and Claydon, in Suffolk, in August, very rarely in June, and always in swamps. Mr. F. C. Adams has taken *E. togatus* at Lyndhurst, and I beat a single specimen (the only one in twelve years' constant collecting there) in the Bentley Woods in June, 1898. *E. cinctus* is a garden insect, occurring to me in my garden here and in Chitty's at Huntingfield, in the Blean Woods, and at Lyndhurst. My single *E. melanarius* was taken by Beaumont at Oxshott in September, 1891. *E. rufocinctus* also occurs in gardens: I have it from Monks Wood, Hunts, June 4th, 1905 (Chitty), Buckfastleigh, June, 1905 (de la Garde), and Monks Soham. A couple of *E. braccatus* turned up on August 13th, 1901, at Brockenhurst and Denny Wood; and I have another pair from Beaumont's collection, taken by him in September at Courten, in Ireland, and Taynuitt, in Scotland. The curiously autumnal *E. serotinus* occurred to Tuck at Bungay on September 24th, 1898; Sich has given me one found in Richmond Park on October 29th, 1900; and I took it by sweeping in a very swampy wood at Bramford, near Ipswich, on October 13th, 1899. *E. tener* is probably not rare: Brandon (Chitty), Southwold (Tuck), Lowestoft, Ipswich, and on birch in Tuddenham Fen. *E. carpini* and *E. grossulariæ* should not be rare, but of the former I have found one flying in the sunshine in my garden here on May 8th, one at Brockenhurst in early July, and possess one taken at Chobham by Beaumont, only; and of the latter, two examples from woods at Bentley and Assington, in Suffolk, are all I have obtained. *Taxonus glabratus* is one of our commonest sawflies, and I often see it basking on the leaves of *Alisma* in my moat here; I have it from all over Suffolk, from Cambs (Wicken Fen), Northants (Castor), and

Southampton (Gorham). *T. equiseti* is hardly rarer in Suffolk and the New Forest; Elliott found it at Clunie, in Scotland, on August 16th, 1907. But I do not know the other two species of the genus.

The Dolerides mark the beginning of the end of these remarks, for after them are only the Tenthredinides, which I shall reserve for a final note. Two of our three *Loderi* are known to me: *L. palmatus* by a pair captured at Tostock, in Suffolk, by Tuck in June, 1899, and a doubtful male from Bramford; *L. vestigialis* is not uncommon in marshes at Foxhall, Barton Mills, and Farnham, in Suffolk, from the end of May to middle of June. The genus *Dolerus* is one of the best known and most difficult of elucidation; some of its species are ubiquitous and others extremely rare. I possess but a single female of *D. triplicatus*, captured by the late A. J. Chitty at Colchester in May, 1907; but *D. madidus* is not infrequent from the end of April to beginning of July in marshes at Ipswich, Tostock, Matley Bog, and Burley, in Hants, being sometimes swept at dusk. My single *D. ferrugatus* was found at Gosfield, in Essex, early in June, 1903, by Alfred Beaumont. *D. pratensis* is extremely abundant everywhere; I have found it at all times from April 1st to August 29th about Dover, the Norfolk Broads, and all over Suffolk. On the wing it has a peculiarly straight and sustained flight, accompanied by a distinct humming noise, buzzing along like a Zygænid moth. My only *D. æriceps* was swept at Hursthill, or Queen's Bower, in the New Forest, on July 11th, 1909; but *D. palustris* is much commoner, and turned up at Rookley Wilderness, in the Isle of Wight; at Dunwich, Bentley, Bramford, and Stanstead, in Suffolk; and Gorham found it in Herefordshire. Many of the black-bodied species are abundant, though difficult to name. Of these, *D. gonager* is among the commonest, and usually turns up by sweeping reeds; I have it from Norfolk, Suffolk, Hants, and Kent, the dates of capture varying from May 9th to July 14th. *D. liogaster* seems, on the contrary, to be very rare, since my single specimen turned up on reeds at Theberton, in Suffolk, on July 10th, 1900; but the handsome *D. hæmatodes* is by no means infrequent in my paddock and even on the windows here. I have received it from Doncaster, and used to find it on aquatic plants about Ipswich at Foxhall, and on the banks of the Gipping from April 19th to June 5th. The var. *ravus* of *D. sanguinicollis* is common in Suffolk at Brandon, Lavenham, and Stoke-by-Clare at the end of May; I have also taken it at Burley, in the New Forest, early in July. *D. niger* is a large and fine species, unknown in Suffolk, though it has occurred to me at Setley and Rhinefields, in the New Forest, on July 12th, and at Helpston Heath, near Peterborough, on June 13th. *D. anthracinus* is the earliest of all species in my experience, since I have swept it in woods as early as March 23rd. I took several in 1895, but have never seen it since that year, when it extended only to May 1st, on reeds on the banks of the Gipping, near Ipswich. A single old female, taken in the same district in 1893, is my only exponent of *D. nitens*; but *D. picipes* is common about Southwold, Tuddenham, and Ipswich, in Suffolk, and at Peterborough, from April 11th to the middle of June. My best species is *D. tinctipennis*, Cam., of which a single female was swept from last year's dry reeds in a brackish ditch on the coast at Southwold on April 26th, 1909; this is the second known specimen, but a very diligent search about the same ditch, and within three miles of it, on April 20th–21st, 1910, did not produce a single representative of the genus. *D. fumosus* I have only found in the New Forest, in Matley Bog and Denny Wood, in the middle of June, 1907. Our commonest kind here is *D. nigratus*, which abounds in my paddock throughout May, extending into June. The males fly swiftly in the morning sun about a foot above the grass-tops. I have swept it at Foxhall as early as April 8th, and found it sucking the flowers of a box bush here on the 23rd of that month; it also occurs at Peterborough, Bentley Woods, and in the Isle of Wight. I need say nothing of *D. æneus*, which I have from Skene, on the borders of the Scottish Highlands, to the Isle of Wight and Somerset. It is commonest in June, and does not appear very early. Of *D. rugosulus* I possess but a single example, swept from a hedge-bottom at Blakenham, Suffolk, on April 11th, 1898.

Monks Soham House, Suffolk.

(To be concluded.)

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 248.)

Euproctis labecula, sp. n.

Fore wings yellow-buff, faintly mottled with rusty on the disc; antemedial band represented by some brownish scales above the inner margin; postmedial band narrow, dark brown, incurved and most distinct from below middle to the inner margin, preceded by a whitish line. Hind wings paler.

Expanse, 24 millim.

Collection number, 36*a*.

One male specimen from Takow (on the plains), May 19th, 1906.

Euproctis sparsa, sp. n.

Fore wings yellow, no transverse lines, but the medial area is sparsely sprinkled with black scales except near the costa. Hind wings whitish slightly tinged with creamy along the veins. Under side of fore wings yellowish and of hind wings whitish.

Expanse, 34 millim.

Collection number, 745*a*.

A male specimen from Rantaizan (7500 ft.), May 14th, 1909.

Euproctis dissimilis, sp. n.

♂. Head, thorax, and abdomen cinnamon-brown, the latter whitish mixed. Fore wings cinnamon-brown, thinly powdered with darker scales; ante- and postmedial lines whitish, the former angled above middle, and the latter curved towards costa. Hind wings and under side of all the wings whitish sprinkled with fuscous.

♀. Head, thorax, and fore wings yellow; the whitish transverse lines on the fore wings only faintly in evidence. Hind wings, and under side of all the wings, yellowish white; abdomen whitish buff, anal segment and edges of the others darker.

Expanse, ♂ 26 millim., ♀ 34 millim.

Collection number, 33*a*.

Two specimens reared, August 30th, 1906, from larvæ found at Anping (on the plains) earlier in the month.

Euproctis kanshireia, sp. n.

♂. Head, thorax, and abdomen pale ochreous, anal tuft orange-brown, and the two segments immediately before it dark brown. Fore wings pale ochreous, clouded with greyish on the costal area, and sprinkled, except on outer margin, with dark brown scales; ante- and postmedial lines of the ground colour, without dark brown scales; the first line is slightly oblique, and preceded by a greyish band sprinkled with dark brown scales; the second line is followed by a greyish band, from which two spurs run to the outer margin; a black spot at apex has a dot above it and another below, the latter rather indistinct. Hind wings fuscous grey, outer margin whitish. Under side of fore wings fuscous with a twice interrupted pale yellow border to outer margin; hind wings whitish clouded with fuscous at the extreme base.

♀. Pale sulphur yellow, the dark grey band following postmedial is sprinkled with dark brown scales; the abdomen is fuscous grey with orange-brown anal tuft.

Expanse, ♂ 30 millim., ♀ 44 millim.

Collection numbers 747 and 1201*a*.

One example of each sex from Kanshirei (1000 ft.); the male captured in April, 1908, and the female in May, 1907.

Euproctis inornata, sp. n.

♀. Head and thorax pale brown, rusty tinged; abdomen greyish brown, anal segment yellow. Fore wings pale brown, sprinkled with black scales; three double whitish spots on the outer margin; an obscure dark central band, interrupted above the inner margin and bifurcate towards the costa, the outer arm indistinct, the inner enclosing a discal dot. Hind wings fuscous merging into whitish on the outer margin.

Expanse, 52 millim.

Collection number, 1202.

One female specimen from Kanshirei (1000 ft.), May 29th, 1908.

Euproctis unifascia, sp. n.

♂. Fore wings yellowish buff; postmedial band brownish, slightly turned inwards towards the costa, edged on each side by a whitish line. Hind wings paler, as also is the under side of all the wings.

Expanse, 21 millim.

Collection number, 36.

Two male specimens, one from Tainan (on the plains), April 17th, 1906; the other from Kanshirei, July 1st, 1908.

The band of the fore wings in the Tainan specimen is narrower than that of the Kanshirei type, the under side of the fore wings is clouded with fuscous, and it measures 24 millim. in expanse.

Euproctis insulata, sp. n.

♂. Head pale brown, thorax reddish brown; abdomen paler, anal tuft yellow buff. Fore wings pale purplish brown, finely sprinkled with black scales; a yellow buff discal spot, around which the black scales are more numerous; outer margins bordered with yellow buff, enclosing a series of black dots (5–7), not extending to the costa; a projection of the ground colour intersects the yellow border one-third from apex. Hind wings pale buff with dusky central shade.

♀. Similar to the male, but the outer marginal border of fore wings is of a deeper colour, and the anal tuft is browner.

Expanse, ♂ 48 millim., ♀ 60 millim.

Collection number, 1781.

Two male specimens and one female taken in May, 1909, at Rantaizan (7500 ft.).

Allied to *E. marginata*, Moore, from Sikkim.

Pida postalba, sp. n.

♂. Head and thorax brown inclining to reddish, palpi blackish above, tawny beneath; abdomen blackish, segmental divisions whitish, anal tuft yellow. Fore wings greyish brown, sprinkled with blackish scales, and with indications of pale ante- and postmedial lines; a large creamy white apical patch, and a narrow white lunule at outer extremity of the cell. Hind wings white, with some fuscous hairs on the abdominal area.

♀. Fore wings greyish brown, without apical patch; antemedial and outwardly angled postmedial lines pale grey but not distinct except towards the inner margin and the costa; the space between the lines is of an obscure olive brown tint; lunule at end of the cell very faint; hind wings white.

Expanse, ♂ 54 millim., ♀ 57–60 millim.

Collection number, 1782.

One male in rather poor condition and two females from Rantaizan (7500 ft.), May 9th–11th, 1909.

Allied to *P. apicalis*, Walk., from Sikkim.

Lælia striata, sp. n.

♂. Head and thorax whitish with a pinkish brown tinge, the former marked with red at base of the antennæ; palpi pale brown above, marked with blackish, reddish below. Fore wings greyish brown, veins, streaks between the veins, and the fringes whitish tinged with pink; a series of seven black spots on the outer margin, four and six linear. Hind wings and abdomen whitish. Under side whitish, fore wings clouded with fuscous.

Expanse, 48 millim.

Collection number, 1200.

One male specimen from Kanshirei (1000 ft.), April 28th, 1908.

Pantana simplex, Leech.

♀. Fore wings whitish with a faint ochreous tinge along the veins and margins; four brownish spots below the cell. Hind wings white, finely powdered with ochreous scales on the outer margin; fringes ochreous tinted, preceded by an ochreous line.

Expanse, 39 millim.

Collection number, 40.

Three specimens from Kanshirei (1000 ft.), August, 1905.

Two of the specimens are without the brownish spots below cell of fore wings, and are rather paler than the type described above.

Leech only received male specimens of *P. simplex* from Western China. I obtained both sexes of the species in Formosa; the males do not differ in any material respect from Chinese examples of the same sex.

Rhagastis varia, sp. n.

Head and thorax rich olive-brown, laterally edged with whitish mixed with brown; some reddish scales on the metathorax; abdomen paler marked with reddish on the sides, two black dots on each of the last three segments. Fore wings pale brown with a violet tinge, the costa paler; basal third, and a stripe along costal area to near apex, olive-brown, the former clouded with blackish towards inner margin; antemedial line black, medial band blackish, both angled about the middle, the latter diffuse near inner margin; postmedial line indicated by two blackish chevrons near costa and some blackish dots thence to inner margin; a black dot at end of cell, a blackish cloud between veins five and six, a smaller one below on inner margin, and a triangular one at apex. Hind wings fuliginous brown, darker towards outer margin and paler on costa. Under side reddish orange, freckled with brown; a smoky grey patch below the costa of fore wings extends from the base of the wing to the almost straight, dusky, postmedial line; border of outer margin greyish brown, tapered towards apex, projecting inwards between veins four and five to postmedial line.

Expanse, 55 millim.

Collection number, 711.

A male specimen from Kanshirei (1000 ft.), June 7th, 1907.

Stauropus nigribasalis, sp. n.

Head grey, thorax blackish mixed with grey, a whitish mark on the metathorax; abdomen grey, darker on the back of anterior segment. Fore wings grey, the basal third, except near costa, black, enclosing a greyish patch at base of the inner margin; stigmata outlined in whitish; antemedial line blackish, waved, indented at median vein, thence oblique to middle of the inner margin, inwardly edged with whitish; postmedial line blackish, edged outwardly with whitish, serrate, incurved at end of cell, a blackish cloud beyond on the inner margin; submarginal line blackish, not clear above vein seven, but thence to vein three nearly straight, lunulate, and marginal from vein three to inner margin. Hind wings whitish suffused with fuscous, hairs on inner area brownish; a patch of grey mixed with whitish at outer angle; fringes whitish.

Expanse, 52 millim.

Collection number, 1778.

One male specimen from Rantaizan (7500 ft.), May 9th, 1909.

Stauropus pulverulenta, sp. n.

Head, thorax, and fore wings grey dusted with blackish; antemedial line ochreous, indistinct; postmedial line ochreous, indented at middle, brownish spots upon it. Hind wings grey dusted with blackish, basal area suffused with darker.

Expanse, ♂ 52 millim.

Collection number, 1219.

One male specimen from Kanshirei (1000 ft.), April 27th, 1908.

Stauropus confusa, sp. n.

Head grey, thorax whitish mixed with grey; abdomen brown, grey mixed towards base, terminal segments grey. Fore wings grey, slightly tinged with ochreous on the disc; a black mark near base of the wing under the median vein; the costal area above the mark white flecked with black; two wavy transverse lines before the middle, and two others, with traces of a third, beyond the middle; all the lines are dark grey but not very distinct; submarginal line dark grey, intersected by dark grey veins. Hind wings whitish clouded with grey on costal area; hairs on basal area grey-brown; a dark grey line before the white fringes.

Expanse, 54–56 millim.

Collection number, 1777.

Two male specimens from Rantaizan (7500 ft.), May, 1909.

In the cotype the transverse lines are less distinct than in the specimen described above, but the black mark on the first postmedial is bidentate and more conspicuous.

Fentonia variegata, sp. n., *sordida*, Wileman, ined. ab. *formosana*, nov.

♂. Antennæ pale reddish brown, shaft darker; head grey, thorax dark grey finely mixed with paler grey; abdomen greyish, brownish towards thorax. Fore wings grey, basal area darker, dusted with whitish, and limited by a blackish crenulate line from costa at one-quarter to middle of the inner margin; postmedial line whitish, black-edged, wavy, dentate about middle, followed by a dark shade-like band which is interrupted below the middle; medial area clouded with brownish towards the postmedial, and with whitish towards the basal patch; a series of black lunules before the outer margin. Hind wings fuscous, browner towards the base.

♀. Head and collar grey, the latter dark edged; abdomen brownish, last three segments greyish. Fore wings grey, as in the male from Formosa, but all the markings more distinct, and more white on the medial area.

Expanse, ♂ 48 millim., ♀ 54 millim.

Collection number, 1217.

One example of each sex from Kanshirei (1000 ft.). The male was secured May 11th, 1907; the female, which is in better condition than the male, was taken in August, 1908. The typical male of this species has already been described by me from Japan in a paper not yet published. The Formosan male is greyer in colour; the female, which sex had not been captured by me in Japan, is now described.

General distribution: Japan; Formosa.

Fentonia nigrofasciata, sp. n.

Antennæ pale reddish brown, head and thorax blackish grey; abdomen brownish. Fore wings grey, sprinkled with darker; a broad, oblique, whitish sprinkled, black band precedes a dark-brown antemedial line, the latter wavy to middle, thence outwardly oblique to the inner margin, between it and the band is a narrow space of ground colour; postmedial line, double, wavy, almost parallel with the outer margin; submarginal line blackish, lunular. Hind wings fuscous brown. Under side greyish suffused with fuscous, especially on the fore wings.

Expanse, 50 millim.

Collection number, 1218.

One male specimen from Arizan (7300 ft.), August 15th, 1908.

Callidula formosana, sp. n.

♀. Brown; an oblong and slightly curved orange band on fore wings, extending from beyond middle of costa to vein two, narrowed at each extremity, widest between veins three and six. Under side of fore wings orange freckled with brown on costal and outer margins; band paler, limited by brown lines; three dark ringed grey spots in the cell, the smaller one nearest the base, and the larger one at outer end of cell; hind wings yellowish freckled with orange and brown; two, almost central, dark ringed grey spots, and a similar but smaller spot nearer the base.

Expanse, 34 millim.

Collection number, 31.

One female specimen from Kagi (on the plains), November 24th, 1904.

Closely allied to *C. attenuata*, Moore; possibly a local form of that species.

Thyatira arizana, sp. n.

♂. Fore wings smoky brown with five ochreous brown spots—one at the base produced outwards and enclosing a small fulvous cloud, one on the costa just beyond middle, a double one below it on the inner margin, a large one at apex, and a smaller one at inner angle. Hind wings and under side smoky brown.

Expanse, 44 millim.

Collection number, 1686.

One male specimen, in rather poor condition, from Arizan (7300 ft.), September 15th, 1908.

Tyana ornata, sp. n.

♂. Head and collar pale pinkish brown, thorax green, abdomen pale brown. Fore wings green, costa narrowly pale pinkish brown; a pale pinkish brown dot in the cell, and one below, both margined with darker; a series of similar dots forming a sinuous submarginal band. Hind wings, and under side of all the wings whitish, silky.

♀. Head and thorax pale pinkish brown; abdomen whitish brown. Fore wings green, pale pinkish brown at base and along edge of costa; a pinkish brown dot at end of the cell, this is ringed with darker, and between it and the inner margin are two more or less confluent marks of a similar colour; an irregular pinkish brown patch on the outer marginal area, not extending to costa, reddish points between the veins on the outer margin. Hind wings whitish, silky. Under side whitish, fore wings tinged with fuscous.

Expanse, ♂ 19 millim., ♀ 29 millim.

Collection number, 71.

One example of each sex from Kanshirei (1000 ft.); the male captured July 6th, 1908, and the female in May, 1907.

(To be continued.)

NOTES AND OBSERVATIONS.

Zeuzera pyrina Larva attacking Jasmine.—In July last I bred a specimen of *Z. pyrina* from a larva found feeding on the stem of a yellow jasmine.—Alfred Sich; Chiswick.

Forficuline Maternal Care.—At Hereford, some time, I think, in the seventies, when entomology was almost laid aside, I made an observation of which Dr. Sharp's note on the habits of an earwig reminds me. I remember writing about it to Prof. Westwood, chiefly as regards the joints added to the antennæ with each moult in the young earwigs, but I think I sent no notice to any magazine. I found more than one earwig's nest in which the young and pale earwigs were at home with their mother till quite half grown. But the point I remember as most attracting my attention was the presence in the nest of bits of grass; the details I forget, but I felt no doubt that these were brought in by the mother earwig, and were food for the young, which were too small and soft to forage for themselves, but whether they nibbled this grass, or whether the mother further prepared it for them, I do not recollect ascertaining. It curiously happens that last July 2nd, on the Eggishorn, I observed an earwig, looking to me like *auricularia* but possibly some other species (I enclose the specimen so that it may be identified),* carrying a piece of grass, no doubt, I imagined, to take it to its nest for its brood. The piece of grass was rather slender, and of a length to project some 2 or 3 mm. in front and rather more behind the insect as it carried it underneath and parallel with its length. I watched it for some time, and came to the conclusion, owing to its uncertain wanderings, that it had lost its way. It was on a footpath, and as it examined different hollows, it seemed probable that the nest was in the path, but that the entrance had been damaged or closed either by me or some other passer-by. This was shortly after midday, an unusual time for an earwig to be at large, so that possibly it had been wandering since early morning, though, if so, one would hardly expect it to have stuck to the bit of grass all the time. Once an impediment made it drop the grass and pick it up so that it was transverse to the line of march, but as soon as it was clear it again dropped it and picked it up, so as to replace it in its position longitudinally beneath it, obviously the one in which it could be most easily transported. There must surely be somewhere some record of how the young earwigs are fed in the nest, but no reference is made to the point in De Geer (as quoted by Kirby & Spence) or by Dr. Sharp either in the note in the 'Entomologist' or in the Cambridge Natural History. My observations show that the mother provides the food, but details are much to be desired.—T. A. Chapman; Betula, Reigate, September 10th, 1910.

Phibalapteryx lapidata Reared on Clematis jackmanii.—During the present month (September) I have had the pleasure of rearing seven specimens (two males, five females) of *P. lapidata*. The larvæ hatched (March 9th-30th) from ova deposited by a female captured in the Glasgow district during the previous autumn. About a score of the earlier hatched larvæ were provided with leaves of a rue (*Thalictrum adiantifolium*), buttercup, and a coarse kind of grass; but although they seemed to eat the rue they did not thrive, and ultimately died. The later larvæ were supplied with shoots of *Clematis jackmanii* and *Thalictrum*, and they at once took to the former, entirely neglecting the rue. On May 11th there were eight alive, and these varied in size, the largest being about three-quarters of an inch in length when resting. One larva spun up on May 15th, and all the others had prepared for pupation by the 28th of that month. A female specimen emerged on September 9th, followed by two males and a female on the 14th. The seventh specimen (female) appeared on the 25th. Forty-three eggs were deposited during the nights of the 15th and 16th by the female that emerged on the 14th; these, which appear to be fertile, were laid loosely. Hellins, in his excellent life-history of *P. lapidata* (E. M. M. viii. 165), states that the larva he had under observation did not make a cocoon, but merely spun a few threads of silk. All my larvæ constructed cocoons of silk, sand, and tiny stones; in one case four of these were attached side by side, and in another two. One I disturbed before pupation had been effected, and the bottom of the cocoon being more tender than the top, broke open and exposed the larva. The next day the pupa was formed, and it was then of a light orange colour. Shortly afterwards it changed to a rather pale chestnut red, with the wing-cases slightly greenish for a time. Later it became reddish brown, as are the empty pupa-shells at the present time.—RICHARD SOUTH.

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* [Species not yet determined; name will be given in November.—Ed.]

CAPTURES AND FIELD REPORTS.

HYDRŒCIA CRINANENSIS IN IRELAND.—During August last I was fortunate enough to find specimens of *Hydræcia crinanensis*, of the melanic form, near Londonderry. They were taken about the end of the month. Mr. Pierce has examined all the specimens, so there can be no doubt as to their being correctly named.—H. R. SWEETING.

OCCURRENCE OF ÆSCHNA ISOSCELES, Müll., NEAR KING'S LYNN.—On June 15th of this year, a large dragonfly flew into a house about three miles from King's Lynn, and was brought to me two days later. From its early appearance, I at once thought it to be *Æschna isosceles*, and a reference to Mr. W. J. Lucas's work on British Dragonflies soon convinced me that it could be none other than a female of that extremely local species. The Norfolk Broads, so far as this country is concerned, must, I suppose, be considered the home of this fine insect; but so far as I know this is the first time it has been met with in this part of Norfolk.—E. A. ATMORE, F.E.S.; King's Lynn, Norfolk, September 19th, 1910.

LEPIDOPTERA AT CHISWICK AND BARNES.—With the exception of three species, lepidoptera have been scarce here this season. *Gracilaria syringella* has been perhaps more abundant than usual, and I have seen a larger number of *Crambus culmellus* than I remember previously, though this species is usually very abundant. The third species, which has been more common this year, is *Bryophila perla*. On a wall, where I usually see two or three specimens, I counted twelve, on August 24th. I have never seen any but the grey typical form here. At Barnes, August 31st, I saw a fine fresh example of *Acronycta megacephala*.—ALFRED SICH; Chiswick.

SENTA MARITIMA IN SURREY.—In confirmation of Mr. Percy Richards's note (Entom. xliii., 251), I should like to add that I took three specimens of *Senta maritima* (*ulvæ*) on July 17th of this year, at the Black Pond, Esher, the locality Mr. Richards suggests.—E. S. A. Baynes; 120, Warwick Street, S.W.

Senta maritima in Surrey.—With reference to the note (*antea*, p. 251) on *Senta maritima* (*ulvæ*) in Surrey, the following will be of interest. On July 13th, 1906, I took a damaged male at light here. Although I have worked lamps each year since then, I have not met with it again. Meyrick in his handbook gives, as its range, Surrey to Norfolk and Cambridge, but the Victoria History of Surrey does not record it as occurring in the county.—F. W. J. Jackson; Woodcote End House, Epsom.

Pachys betularia ab. doubledayaria in Surrey.—Perhaps the following notes on the occurrence of *Pachys betularia* ab. *doubledayaria* may be of interest. Commencing to collect here in 1904, I only met typical *betularia* till 1907, when I bred a very nice dark intermediate female. In 1909, I bred a female *doubledayaria* and took five typical males, and this year I have taken a *doubledayaria* male at light, and also a typical male and a *doubledayaria* female *in cop.*, from which pairing I have some twenty or thirty pupæ.—F. W. J. Jackson.

Occurrence of the Ichneumonid Œdematopsis ops, Morl.—I have this year captured five specimens, all females, of the above Pimplid, at Wimbledon, by sweeping birches on the Common. The first was taken on May 23rd, two on July 19th, and two more on July 28th. The only known specimen, a female, was taken by Dr. Capron, it is thought possibly at Shere, in Surrey (Ichn. Brit. vol. iii., p. 273), and is now in the collection of Mr. Claude Morley, who very kindly determined my own captures.—Rupert Stenton, F.E.S.

Dilina (Smerinthus) tiliæ at Chester.—On the morning of September 8th, while walking in an avenue of lime trees on the south borders of the city and on the banks of the Dee, I saw a robin two or three yards off about to pick up a large green caterpillar, which had evidently dropped from the boughs overhead. The robin unwillingly allowed itself to be driven away, and then I found the larva to be a full-grown Lime Hawk caterpillar. The species is very rare in the Chester district. The only previous records I can find are an imago captured at electric light in 1899 in the north part of the city, and one in Flintshire in 1870. On reaching home, I put the caterpillar in a flowerpot three parts full of soil, and it immediately began burrowing. It is worth mentioning that the trees forming the avenue are not old ones. Their age will not be more than fifteen years at the outside.—J. Arkle; Chester.

Captures at Electric Light in June, 1910.—The following results from an occasional midnight visit to a couple of street lamps near my home may be of interest. All the moths referred to were found resting on the walls within three or four yards of the lamps, or on the pavement:—*Amphidasys betularia*, one type, one intermediate between the type and *doubledayaria*, and several *doubledayaria*; *Acronycta alni*, one; *A. psi*, many; *A. rumicis*, several; *A. megacephala*, four; *A. leporina*, one; *Notodonta dictæa*, one—all in fine condition. Of course these are only the pick of the total captures.—J. Arkle: Chester.

Late Date for Cyaniris argiolus.—While collecting in the Abbot's Wood district on Thursday last I netted a female *Cyaniris argiolus*, which, although a good deal worn, was quite active. On the same date last year I took full-fed larvæ from the ivy-buds within a few miles of the same spot.—R. Adkin; Sept. 19th, 1910.

Epicnaptera (Gastropacha) ilicifolia in Devonshire.—I had the good fortune, on Sept. 2nd, to take a female *E.* (*G.*) *ilicifolia* at light about 11.15; a very late time of the year, I think, for this moth. The weather was thick, misty rain.—W. J. Monk; Tavistock, Sept. 15th, 1910.

Tortrices in Essex.—I was pleased to find *Eupœcilia udana* at Bowers Gifford on July 9th last, as it is a species I had not previously met with. Two dark narrow-winged moths, with ocellus obscurely defined, were bred from some beech-mast gathered near Thornden Park; these seem to answer the description, given by Barrett, of *Carpocapsa nimbana*.—F. G. Whittle; 7, Marine Avenue, Southend.

SOCIETIES.

The South London Entomological and Natural History Society.—*July 28th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Main, the larvæ and luminous ova of the glowworm, *Lampyris noctiluca*.—Mr. Clark, on behalf of Mr. Gadge, a specimen of a species of mite found at Ventnor on a specimen of *Melanargia galatea*. It was a species of the genus *Trembidium*.—Mr. B. H. Smith reported the larvæ of *Cucullia verbasci* found feeding on *Budleya variabilis*.—Mr. Edwards, a box of exotic Satyrinæ, including *Neorina crishna* from Java, and several species of the genus *Citherias* from Central America.—Mr. Sich reported finding a larva of *Zeuzera pyrina* (*æsculi*) attacking jasmine.

August 11th.—The President in the chair.—Mr. Carr exhibited the ova of *Acidalia straminata*, from Oxshott, on heather.—Mr. Sich, sallow-catkins met with during the past week, and ova of *Eupithecia subumbrata* laid on leaves of yarrow.—Mr. Rayward, a specimen of *Adopæa flava* (*linea*) in a moribund condition from being attacked by no fewer than twenty-one mites. He also showed the egg-shells of *Phorodesma smaragdaria* and *Geometra vernaria*, and made comparison of the surface structure and the method of oviposition.—Mr. West (Greenwich), specimens of Coleoptera and Hemiptera recently met with by him attacked by mites.—Mr. R. Adkin, a number of "white butterflies", from North America, sent him by Mr. Lachlan Gibb, including a series of the introduced *Pieris rapæ*, a series of *P. oleracea*, and three specimens taken near Lost River, Canada, in May last, about which comment and opinion were requested.—Mr. Turner, a short series of *Coleophora silenella* (?) bred from the heads of wild sweet-william sent him by Dr. Chapman from the South of France. He also exhibited the nest of a species of *Polistes* wasp, found at Zermatt in July, 1909, suspended in a bush of alpine-rose (*Rhododendron*).—Captain Cardew, an extremely fine confluent example of *Anthrocera viciæ* (*meliloti*), taken in July in the New Forest. —Mr. A. E. Gibbs, a series of *Epinephele jurtina* from Algeria, having the females of the extremely large and bright form, var. *fortunata.*—Mr. Edwards, a box of Satyrinæ, including a series of the extremely dimorphic species, *Heteronympha merope*, from Australia.—Mr. Enoch, living specimens of the egg-parasites, Mymaridæ, taken in Richmond Park.—Hy. J. Turner, *Hon. Rep. Secretary.*

RECENT LITERATURE.

The Dermaptera (*Earwigs*) *of the United States National Museum.* (From Proc. of the U.S. Nat. Mus. vol. 38, pp. 443-467.) By M. Burr, D.Sc. Washington. 1910.

A valuable paper to students of the Orthoptera in general and Earwigs in particular.

W. J. Lucas.

Experiments on the Generation of Insects. A translation, by Mab Bigelow, of Francesco Redi's Italian Treatise of 1688. Chicago. 1909.

We are pleased to see this translation of one of the works of the older school of naturalists, and hope that others of a similar kind will follow. The period when Redi wrote marks the commencement of a new epoch in the history of biology. The theory of "spontaneous generation" was beginning to be discredited, and Redi was one of those who looked with favour on the dictum, "omne vivum ex ovo." He, however, stands out pre-eminent at this early date, in that he put to the test of experiment the theory he advocated. In the main, the truth of this dictum was borne out by his experiments, though he was led to waver in the matter of gall-insects. If somewhat crude, most of the numerous large woodcuts are singularly suggestive of what they are intended to portray.

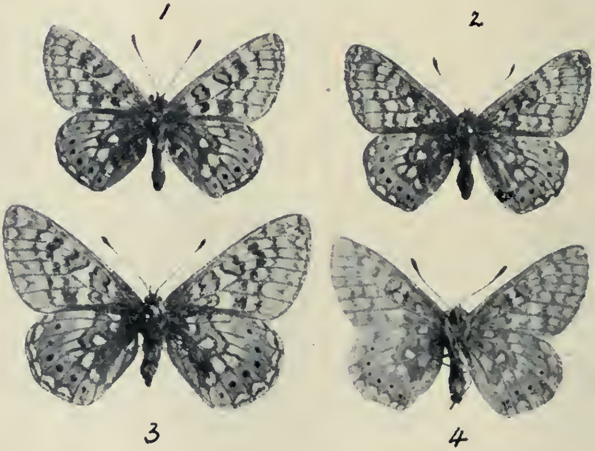
W. J. L.

The Plume-Moths of Ceylon. Part ii. By T. B. Fletcher, R.N., F.E.S., F.Z.S. (Reprinted from 'Spolia Zeylanica,' vol. vi. part xxiv., May, 1910.)

The first part (pp. 39, five plates and a map) of this important work appeared in March, 1909. It treated of the Pterophoridæ, thirty-seven species of which were then known to occur in Ceylon.

In the part now under notice (pp. 22 and two plates) the Orneodidæ are discussed. Twelve of the thirteen species belonging to this group found in Ceylon are referred to the genus *Orneodes*, Latr.; but the author remarks that two of these—*brachyptera*, Meyr., and *microscopica*, n. s.—present structural characters upon which new genera might be founded.

The plates are admirable, and all but two of the species dealt with in the text are figured thereon. Diagrams of wing structure, in the case of one species not portrayed on the plate, are given in the text; and *Triscœdecia dactyloptera* is represented by a cut.



MELITAEA AURINIA Rott., Var. AURUNCA. Turati. (× 1).

1 and 2 ♂. 3 ♀. 4 ♂ underside.

Gibbs & Bamforth, Ltd., St. Albans. *Photo:* P. J. Barraud.

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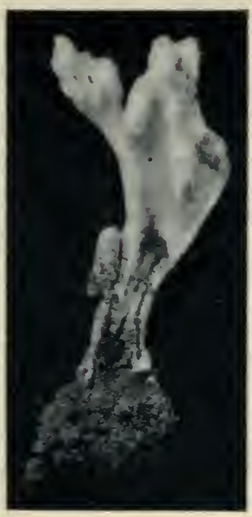
CORDYCEPS MILITARIS.

BY G. T. LYLE.



G. T. Lyle, photo.

IT is well known that certain species of fungi are developed on pupæ, generally in the ground, but it would seem that the occurrence of these fungi growing in captivity is somewhat rare, so I was much surprised to find recently a well-developed specimen attached to a silk and earth cocoon containing a dead Geometrid pupa (probably *Oporabia dilutata*) in one of my glass-topped metal boxes which contained a little mould. The specimen has been kindly identified for me by Mr. J. F. Rayner, of Southampton, as *Isaria farinosa*, the conoidal state of *Cordyceps militaris.* The colour was creamy white, texture mealy. The photograph is twice natural size.

Bank House, Brockenhurst.

[Folsom, in his remarks on insects in relation to plants,* writes:—"Those who rear insects know how frequently caterpillars and other larvæ are destroyed by fungi that give the insects a powdered appearance. These fungi, referred to the genus *Isaria*, are in some cases known to be asexual stages of forms of *Cordyceps*, which forms appear from the bodies of various larvæ, pupæ, and imagines, as long, conspicuous, fructifying sprouts."

Of the life-cycle of fungi parasitic on the various stages of Lepidoptera, the entomologist, as a rule, knows very little. Possibly the study is one that appeals more especially to the botanist, but the subject is not without entomological interest. In the 'Entomologist' for 1878 (vol. xi.), p. 121, there is an article by the late Dr. F. Buchanan White entitled "Notes on Certain Parasitic Fungi which attack Insects"; a figure of a larva of *Mamestra brassicæ*, with fungus thereon, is given. The late Mr. W. H. Tugwell, in 1891, at a meeting of the South London Entomological and Natural History Society, exhibited some parasitic fungi that had destroyed a number of pupæ of *Eucosmia certata* in one of his breeding-cages. Some pupæ of *Gortyna flavago*, afterwards placed as an experiment in the same soil, were also attacked by the fungus and killed (Entom. xxiv. 306). Another exceedingly interesting contribution to our knowledge of the vegetal enemies of insects is by Mr. F. V. Theobald, published in the 'Entomologist' for 1897 (vol. xxx.) p. 162; this is also illustrated. Scattered through the volumes of this Journal are several notes and articles on the "Vegetable Caterpillar of New Zealand"; the latest, by Mr. Alfred Philpott, was published in volume xxxix. p. 174 (1906).

We may add that in future British "Vegetable Caterpillars" will have a place in the National Collections at the Natural History Museum, South Kensington, and Mr. Hartley Durrant, of the Museum, will be glad to receive such material. —Ed.]

MELITÆA AURINIA, Rott., var. *AURUNCA*, Turati.

By Philip J. Barraud, F.E.S.

(Plate V.)

This interesting form of *Melitæa aurinia* was discovered by my friend Signore Orazio Querci, of Formia, on May 25th, 1909, in the Aurunci Mountains at about 2500 ft. elevation, and a month later on Monte Petrella at about 5000 ft. The Aurunci Mountains are in southern central Italy, and lie towards the Mediterranean coast, about mid-way between Rome and Naples.

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* 'Entomology, with Special Reference to its Biological and Economic Aspects,' p. 258 (1906).

They are divided from the main system of the Apennines by the river Garigliano (the Liris of the ancients). Specimens were submitted to Count Emilio Turati, of Milan, who has given this form the name of *aurunca*.

The most striking feature is the wide median line on the upper side fore wing (fig. 1), but this is a variable character, and occasionally it is much reduced, with a consequent darkening in other parts of the wing (fig. 2). The ground colour is rather pale yellow, the outer band fore wing and the hind wing being more fulvous. The hind wing upper side also has a row of bluish, submarginal, lunular markings, corresponding in this respect with var. *provincialis*, Bsdv. Otherwise the appearance of the upper side reminds one more of var. *alexandrina*, Stgn. The under side is very similar to var. *provincialis*, Bsdv. The males measure from 33–36 mm. in expanse, and the females 37–43 mm.

When visiting Signore Querci, last year, I had the pleasure of taking a fair number of specimens on Monte Petrella.

NOTES ON A BUTTERFLY HUNT IN FRANCE IN 1910.

I.—In the North-East.

By H. Rowland-Brown, M.A., F.E.S.

The May weather of the south-eastern and midland districts of England had been so beautiful, the number of insects on the wing so numerous, that it was with more than the ordinary anticipation of favours to come that I set out for a summer holiday in France towards the end of June with Mr. B. C. S. Warren as my companion.

Our first objective was the Forest of Samoussy, a fine tract of State woodland in the Department of the Aisne, within a few minutes railway travel of Laon, the second stopping place between Calais and Bâle of the trans-continental expresses. A perfect crossing, with sunshine and blue sky, just a passing shower soon after landing, and a warm clear night filled with stars, seemed to justify hopes of a successful chase on the morrow. The small inn and "marine" store at which we had engaged quarters is about ten minutes' walk from a siding in the midst of the forest, and as "the domestic" wheeled our bags and entomological impedimenta down a velvet-dark alley of overhanging trees, we congratulated ourselves on the certainty of meeting some at least of the numerous interesting species detailed by Mr. W. G. Sheldon (Entom. xl., pp. 75–77, and pp. 197–199), which, also on the authority of Mr. Henry Brown, of Paris, are known to occur plentifully at Samoussy. But, alas!

for our calculations. When the morning of the 24th broke—Midsummer Day!—the wind had settled in the south-west; heavy clouds were rolling up from the direction of the sea, and the towers of Laon Cathedral, which we had visited and admired so much the night before, though ten miles away, seemed, "like Birnam Wood," to have come to our own particular "Dunsinane." For five mortal days the wind blew, and the clouds gathered to discharge upon us endless falls of unwelcome rain, and rare, indeed, were the intervals of sunshine when we could unfurl our nets and take a modest toll of the few butterflies in evidence. We had been expecting M. René Oberthür, also, to join us, but much to our regret he determined to postpone his visit in view of the uncongenial weather which extended right across Northern France from west to east, and far down beyond Paris. Whenever there was the least hope of taking anything we sallied out, but in the days of our visit our combined efforts produced barely a hundred examples. Of *Limenitis populi*, the first and foremost object of my desire, we saw but one single example, seated on the warm, wet sand, which is the prevailing soil, fanning its wings in a momentary gleam of sunlight. It proved too nimble, however, for our nets, and we left Samoussy without so much as a glimpse of another. *Chrysophanus hippothoë*, which Mr. Sheldon had reported very common in the marshes, was also unaccountably absent, while *Araschnia levana* of the first generation was represented by a couple of battered females. Of *Thecla pruni* we saw no trace, which was the more remarkable as the privet was in full blossom, and swarming with splendid Diptera. On the flower-heads of the same shrub I captured one or two belated females of *Melitæa maturna*, one alone being considered of "cabinet rank," while a second we caged on its food-plant, eventually taking her off to the Midi, where she died without depositing a single egg: no doubt from want of sufficient sun warmth to encourage oviposition. *Thecla ilicis* was, however, in perfect condition and not uncommon. Of *Erebia medusa* we found no trace, but evidently common enough, "weather permitting," were *Limenitis sybilla, Melitæa athalia, M. dictynna*, and *Cœnonympha arcania*, the three last-mentioned presenting somewhat interesting forms: the Melitæas with a strong melanic tendency, *C. arcania* (which was going over) displaying a marked inclination in the females to develop the brownish-yellow markings of the fore wings on the lower wings as well—a form, as I am told by M. Charles Oberthür, characteristic of Samoussy and, no doubt, the other fine forests which exist between Laon and Paris. A pupa of *Polygonia c-album*, found by Mr. Warren, emerged a few days later at Lyons. Most abundant of all the butterflies, however, was *Pararge achine*, as a rule settling high on the White-poplar trees, to which we looked in vain for *L. populi*, but not superior to the attractions of a long-defunct rabbit, over which they flitted incessantly, settling finally, as one sees the Lycænids at the water's edge of a hot July day in the mountains. We also bagged odd specimens of *Nomiades cyllarus*, *Hesperia alveus*, and *N. semiargus*, while here and there rain-soaked *Aporia cratægi* and *Argynnis aglaia* would be seen glued to the flower-heads of *Centaurea nigra*. With *Adopæa sylvanus* and occasional *Argynnis selene* our meagre captures came to an end, and, as the weather showed no sign of amendment, and the barometer refused to budge the fortieth fraction of an inch in the right direction, we reluctantly packed up our traps on the 27th and took the train to Paris.

Generally speaking, and from experience gained elsewhere in France, and latterly at Rennes, what must strike the British collector as inexplicable is the absence in our own country of certain butterflies common enough in the northern French woods and plains. The conditions, geographically and geologically, appear identical; the climate of the forest region of the north approximates sufficiently to that of our southern and midland enclosures; the winters are not as a rule more humid in the South of England. *Chrysophanus hippothoë*, L. (= *chryseis*, Hb.) has a traditional connection with the southern counties. But why, if it ever really existed otherwise than as an importation, should it have disappeared as effectually as its greater congener, *C. dispar*? The larva is not dependent on the Great Water-dock, as was the case with *dispar*, though *C.* var. *rutilus* in its Continental habitats affects sorrel and bistort; nor is it exclusively a fen species. It occurs in France to the very coasts of the Channel, namely, at Eu, in Seine-Inférieure; it is generally prolific. In the same way *Carcharodus alceæ*, a much stronger winged butterfly, might have been expected to cross the sea and establish itself on our south-coast mallows, as it also reaches to the water's edge at Cancale, in Brittany, where, M. Charles Oberthür informs me, it is common in the garden of his villa; the haunt also of that successful Devon immigrant, *Callimorpha hera*. In the same way *Hesperia alveus* (a doubtful British capture)—a stout aviator—seems to frequent the entire line of Departments through Ille-et-Vilaine, Seine-Inférieure, and Somme to the embrochure of the Somme.* *Pararge achine* also suggests itself as an ought-to-be British insect, while the occurrence of *Argynnis niobe*† on the sand-dunes of Calais lends probability to the doubtful records of this butterfly in Kent. Possibly the Hesperiids have been overlooked, just as for so many years was *Everes argiades* until its chance discovery by the Rev. Pickard-Cambridge added this charming little "blue" to our scanty and diminishing list of British Lycænas.

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* My authorities for the above observations are M. Charles Oberthür (Études de Lépid. Comparée), M. P. Noel (Cat. des Lépid. de la Seine-Infér.), and M. Postel, late of Mailly-Maillet, Somme (*in litt.*) respectively.

† Recorded by M. Paux (Bull. Sci. de France et de la Belgique, sér. 6, tom. iv. Nord) as "not rare" at Malo-les-Bains (Nord); and by M. Giard in the Boulonaise (Pas de Calais) on the dunes, the food-plant of the larva being *Viola sabulosa*, exclusive in this locality to the coast of these two north-eastern Departments.

Our list of observations for Samoussy includes the following species:—*Hesperia malvæ, Pamphila sylvanus; Nomiades cyllarus, Polyommatus icarus; Thecla ilicis; Pieris brassicæ, P. rapæ; Aporia cratægi; Dryas paphia, Argynnis aglaia, A. adippe* var. *cleodoxa, Issoria lathonia; Brenthis ino, B. dia; Melitæa maturna, M. athalia, M. dictynna; Araschnia levana; Polygonia c-album* (pupa); *Limenitis populi* ab. *tremulæ* (1), *L. sibylla; Pararge achine; Epinephele jurtina; Aphantopus hyperanthus; Cœnonympha arcania, C. pamphilus.* I may add also that I have seen recently, in M. Charles Oberthür's collection, what appear to be undoubted examples of *M. aurelia* from this locality; and the same authority gives us in the last instalment of his 'Études de Lépidoptérologie Comparée' (fasc. iv. p. 142) an account of an expedition to this lovely forest on June 13th of last year, made by Mr. Harold Powell, F.E.S., M. René Oberthür, F.E.S., and Mr. Henry Brown, in search of *Chrysophanus dispar* var. *rutilus*. This beautiful insect they did not find in the marshes, nor in the recorded habitats of the species near St. Quentin, from which it has disappeared altogether apparently. In addition to the butterflies enumerated above, however, they observed *C. hippothoë* (= *chryseis*), quite fresh; *Erebia medusa*, going over; *Melitæa aurinia*, passé; *M. cinxia*, rare and in bad condition; the above-mentioned *M. aurelia*; and *Hesperia carthami.* From which it will be seen that the forest is particularly rich in Melitæas as well as Apaturids, and that, given normal June weather, a very decent bag may be made at this particular season of the year.

Before concluding this brief account of our first experiences of the Aisne, I should like to say that Samoussy and the forests further west towards the Belgian frontier, as well as eastwards, offer a fine field for collectors of all Orders. The ponds, marshes, and meadow-sweet bordered runnels which march with the several main rides of Samoussy teem with insect-life, especially Odonata. My French friends inform me that the coleopterous fauna is hardly less rich. But I would advise entomologists who contemplate a visit securing their accommodation well ahead. There is one *auberge* only, kept by M. Hemmery, the local *agent des vins*, and but two or three bedrooms at the most. Nevertheless, for a country inn the accommodation is excellent, the rooms spotlessly clean, the cooking surprisingly good, considering the remoteness of the place, and a pleasant contrast to that of the hotel we dined at in Laon, which was both dear and none too well "found." Above all, it is on the verge of the forest, and the name of the proprietor is sufficient password in such parts of it as are preserved under the eye of the *garde-forestiers*.

(To be continued.)

P. ATALANTA AB. *MERRIFIELDOIDES.*

By T. Reuss.

This season I was not able to find any larvæ of *P. atalanta* till the last days of August. Then, by the middle of September I captured fifty-eight larvæ, mostly full-fed, belonging to two different broods, but I never once saw an imago on the wing.

Ten of the smaller larvæ and half of all the resulting pupæ (fifty-six, two were ichneumoned) were forced in + 30 to 42° C. These produced fine red or rose-banded specimens, often with a well-known rusty red suffusion at the apex and at the base of the fore wings (ab. *æstiva*). Among the imagines, from pupæ of which the larvæ had not been forced, I found one specimen with small violet-blue centres in the black spots just beyond the orange-red band in the hind wings.

The other twenty-eight pupæ were kept in the shade temperature of the season—rarely above 16° C.—and when they began to emerge, I found that several of the imagines, which were very fine in colour, had actual ocelli in the hind wings.

From my previous experiences with this and other Vanessid species, I think it is very probable that these blue-centred hind wing ocelli in *P. atalanta* (found also in two other Pyrameid species distantly resembling *P. atalanta*, viz. *P. abyssinica*, Africa,* and *P. gonerilla* of New Zealand) are the result of a cool maritime climate, influencing already the oval and larval stages, and that if *P. atalanta* became at home in England (Mr. L. W. Newman, Bexley, succeeded in hybernating some specimens indoors last winter; it will be remembered that "wild" *V. io, urticæ* also hybernate "indoors"), then the species would develop ocelli in the hind wings as described.† Blue spots in the hind wings were,

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* The Vanessids of the tropics mostly seek out the mountainous districts, where they find the more temperate conditions of climate necessary to them. *P. cardui* and *P. atalanta*, of which single specimens (not necessarily swarms) appear to migrate far and wide every year, show this fondness of, and preference for, mountainous regions most markedly by seeking out the hill-lands of the countries which they visit. It will be remembered that in Polynesia (maritime climate) there flies an ocellated form of *P. cardui*, though not to the exclusion of the normal form.

† *Chrysophanus phlæas* shows similar blue spots in the hind wings, which, however, *occur* independent of climate (*vide* Prof. Weissman, Ent. 1896, "New Experiments").

I think, first mentioned in connection with *P. atalanta* ab. *merrifieldi*, Stdfss., bred in the year 1892 by Mr. Merrifield for the first time, and I will therefore call the ocellated aberrations, resulting evidently from the influence of a cool season on already the larval (and oval) stages—*P. atalanta* ab. *merrifieldoides*. The duration of the pupal stage ranged from eight to twenty-seven days. The aberration appeared in *both* broods.

VALUE OF GENITALIA.

By F. N. Pierce, F.E.S.

I am glad to see that at last we have a distinguished entomologist like the Rev. George Wheeler who has the courage to voice what must be in the thoughts of every entomologist attempting to decipher the weird photographs of genitalia that have lately been appearing.

First, illustrations in profile are utterly useless by themselves, because in a vast number of cases the right and left sides differ—that is, they are asymmetrical. Therefore, if anything like an intelligent idea is to be obtained, the objects must be spread.

There is no more difficulty in spreading the majority of genitalia of the Lepidoptera so that anyone can understand and compare them than there is in setting a moth or a butterfly. It is impossible to imagine a collection of Lepidoptera pinned, some vertically through the thorax, some horizontally, some with wings folded over the body like a butterfly, others with them lying close to the sides, &c. Can we imagine any but one who has "made a long and very special study" of insects being able to make head or tail of such a collection? But we know a properly set collection of insects can be compared, part for part and point for point, until the minutest difference is easily observable. Hence the incipient entomologist is first taught to set decently. But this in students of genitalia seems to go for nothing, so that it would seem as if the preparations were purposely made to prevent people from understanding them.

I cannot agree with Mr. Wheeler that no two people can make their preparations quite alike, any more than that no two individuals can set insects the same. Yet, if genitalia are properly spread, I am confident that neither Mr. Wheeler or anyone else could distinguish any difference in the mount. Unlike the wings of Lepidoptera, the parts of the genitalia are mostly fixed, and are bound to lie at the same angle, and assume the same position.

The Elms, Dingle, Liverpool, Oct. 11th, 1910.

THE NUMBER OF LARVAL STAGES OF *LYCÆNA ACIS.*

By F. W. Frohawk, M.B.O.U., F.E.S.

In Mr. Tutt's new work on 'British Butterflies,' vol. iii., pp. 287–8, dealing with the larval stages of *Lycæna acis*—*Cyaniris semiargus*, he quotes my description of the different stages of the larvæ which I published in the 'Entomologist,' July, 1908. To these the author has added footnotes, doubting the accuracy of my statements respecting the number of stages which this larva passes through. This, I think, calls for some comment. The two notes in question are as follows:—

Note 1.—"Frohawk calls this the 'fifth instar,' but seems to have judged this to be so entirely from its different size and its greener tint, changes that occur apparently in this stage without a moult."

Note. 3.—"Frohawk calls this the 'sixth instar'; it is most probably the *fifth*. Chapman only notes five instars for those he reared at the same time."

First, I may point out that I have avoided the use of the word "instar" for that of "stage," and no such word as "instar" occurs in the life-history I published.

In working out the life-histories of certain species, especially the Lycænidæ, unless the greatest care is taken in observing most critically the different moults, one is very apt to miss a stage completely, especially when the larvæ are very young, and for this reason I always keep a few separate, from the moment of hatching until pupation, for special observation; these few I examine with a lens several times daily, and when necessary at night also, to note exactly what is happening; in this way I ascertain precisely when they moult, and at once note it down, and after each moult I make a microscopical examination of each individual and compare them with others of the same brood, so as to check any individual variation that might occur. (This way of working out species is hardly what Mr. Tutt calls in his preface "Frohawk's ontogenetic outlines.") Therefore in this manner I not only see the actual moults taking place, but also see the cast skins beside the larvæ, which I think no one can doubt is sufficient proof. Regarding *L. acis*, I not only noted each moult and stage in this way, but also made careful drawings of each stage.

These particular *L. acis* larvæ, which I worked out from the egg to the imagines, moulted five times, as stated in the published life-history in the 'Entomologist,' July, 1908, p. 165, where I stated—"after fifth and last moult fully grown about two hundred and seventy-five days old. . . . ."

I do not wish to infer that Dr. Chapman (whose description

Tutt also quotes) is wrong in stating he only noted "five instars," as possibly his larvæ may perhaps have moulted only four times under perhaps different conditions in which they were kept. I merely wish to point out the fact that my *L. acis* passed through six separate stages, *i.e.* they moulted five times. It must be borne in mind that larvæ of several of the Lycænidæ, during their earlier stages, feed on flowers, &c., and are then frequently hidden from view, which makes it no easy matter to detect the changes taking place within. This evidently led former authors into error respecting the young larvæ of *L. arion*, who stated that the larva refuses wild thyme as its food after its first moult, whereas it is not until after its third moult that it discontinues to feed on thyme.

As Mr. Merrifield pointed out in his interesting lecture delivered at Brussels this year, during the visit of the Entomological Congress to that city, the number of moults a larva undergoes may vary according to the brood. The larvæ of the summer brood of several species undergo fewer moults than those turning to pupæ which hybernate. By missing a moult the larva develops more rapidly, and the perfect insect is then able to lay the eggs for the hybernating brood in good time for the resulting larvæ to feed up in the late summer and autumn. I do not claim that this fact explains the discrepancy between Dr. Chapman's observations and my own, but it is a point entomologists should bear in mind when criticising life-histories which are the work of two different observers.

I may add, however, that in my experience I have never found a species to vary in the number of moults, in those carefully worked through.

A NOTE ON THE NEW CLASSIFICATION OF CERTAIN HESPERIID BUTTERFLIES.

By H. Rowland-Brown, M.A., F.E.S.

We have received the 'Bulletin de la Société lépidoptérologique de Genève' (fasc. i., June, 1910) containing Dr. J. L. Reverdin's "Note on the Male Genital Armature of several Palæarctic Hesperiids," illustrated by one coloured and two photographic plates. At the same time comes a welcome further instalment of M. Charles Oberthür's 'Études de Lépidoptérologie Comparée,' fasc. iv., 1910, containing, among others, no less than four coloured plates, almost wholly devoted to the same excessively difficult group. In both instances the coloured plates have been executed by M. J. Culot, of the Geneva Society, and for accuracy excel anything that we have yet seen upon this particular subject. In both cases the authors have co-operated with results which will be found eminently satisfactory.

As all collectors are aware, the "Black and White Skippers" of the palæarctic region, especially those of the west, present difficulties of identification which have been augmented to a great extent by hopeless confusion of nomenclature. A certain number of them, however, are easy enough to distinguish, and, being so, have been allowed to retain their original names. These are *Hesperia sidæ*, *H. carthami*, *H. cacaliæ*, *H. andromedæ*, and *H. centaureæ*, and, so far as Great Britain is concerned, *H. malvæ* (*alveolus*). But, as Dr. Reverdin and M. Oberthür point out, it is quite another matter when we come to deal with the *alveus* group, and the *malvæ fritillum* forms. Superficially *alveus*, *carlinæ*, *cirsii*, *onopordi*, and *conyzæ* may so closely resemble one another in their markings and general appearance as to defy separation at sight. Hitherto, therefore, authors have been content to group each one of them from such differences of marking as examples under their immediate supervision seemed to present: the majority, avoiding originality altogether, have satisfied themselves with a repetition of the conclusions arrived at by a few of their more conscientious and painstaking predecessors.

Speaking from experience, the idea of identification by means of the genital armature has been rejected in the case of the Hesperiids under the impression that, to make confusion worse confounded, the structure of these organs varied with individuals of the same species so much that differentiation thereby was unreliable. In the case of the several species under review, at all events, Dr. Reverdin disposes of any such objection in the *alveus* group. Preparations of the appendages of several *alveus* show that, *inter se*, the form of the armature may vary in detail, but that it still retains specific characters distinguishing it from the armature of others associated with the *alveus* group. Dr. Reverdin demonstrates, in fact, that the appendages of each species present characteristic forms; that they can be separated thereby; and that Rambur, who originally described *cirsii*, *carlinæ*, and *onopordi* as distinct from *alveus*, was right in his classification, and that his diagnosis formed upon the appendages themselves was correct in almost every instance, despite the insufficient and meagre scientific apparatus at his disposal. For the author of the 'Catalogue des Lépidoptères de l'Andalousie' and the 'Faune d'Andalousie' was the first lepidopterist to attempt the differentiation of species in the manner indicated, and to publish the results of his observations with the drawings of the butterflies themselves. Of *conyzæ*, of course, Rambur makes no mention, the insect, at the time when his books were published, being still undiscovered.* It is worth noticing, however, that while Dr. Reverdin has unravelled the tangled *alveus* skein by the same entirely scientific methods, M. Charles Oberthür, from personal field-knowledge of the so-called "varieties" of *alveus* and *serratulæ*, and a close study of the series in his museum, has arrived at almost similar conclusions, with the addition of a new species, which, from its association with western France, he names *Hesperia armoricanus*. Both authors refer *Conyzæ* to *onopordi*; *cirsii*, Rbr., retained as a separate species by M. Oberthür, is found by Dr. Reverdin to belong to *carlinæ*, Rbr., the whole group working out as follows:—

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* Described by Guenée from examples taken at Voirons, Savoie, as a new species, 'Petites Nouvelles Entomologiques,' 1877.

HESPERIA ALVEUS, Hb. (mountain form and type).
  (*a*) var. (lowland form).
  (*b*) var. *speyeri*, Stgr. (Advanced to the rank of a species in Staudinger's 1901 Catalogue on extremely slender evidence.)
H. CARLINÆ, Rbr.
  (*a*) var. *cirsii*, Rbr.
  (*b*) var. *iberica*, Gr. Gr.
H. ONOPORDI, Rbr.
  (*a*) ? var. *conyzæ*, Guenée.
H. FRITILLUM, Rbr. (? = *fritillum*, Hb.).
H. SERRATULÆ, Rbr.
  (*a*) var. *occidentalis*, Lucas.*

H. armoricanus is described by M. Oberthür as "more nearly approaching *carlinæ* than *cirsii*," and, pending further investigation, should therefore follow *carlinæ* in the above list. So far it is reported only from Bretagne and the western littoral Departments—as far south as Charente-Inférieure.

Local races of *H. alveus* M. Oberthür also describes and figures as follows:—

(*c*) var. constans, *bellieri* (Larche, Basses-Alpes, and Pyrénées-Orientales).
(*d*) var. ? ab. *numida* (Lambèse, Algeria).
(*e*) var. ? ab. *foulquieri* (Basses-Alpes and Bouches-du-Rhône).
(*f*) var. *ballotæ*, Bsdv., *in litt.* (Dovrefjeld, Norway).

It remains only for entomologists on the spot to breed out the several species and these local forms, in order to put their identity upon an entirely satisfactory and final basis.

Meanwhile, in presenting the summarized results of these two important contributions to our knowledge of the Hesperiid group, I have refrained purposely from entering into details. In the case of the appendages, Dr. Reverdin leaves no shadow of doubt in our mind as to the scientific value and accuracy of his experiments. Of M. Oberthür's descriptions, with the exquisite illustrations attached, we can only add that they bring to bear upon the facts corroborative evidence of the highest importance. Many of us during our wanderings abroad have collected ample material to test for ourselves the accuracy, if not the finality, of these respective conclusions. Our cabinets and store-boxes teem with unnamed or wrongly-named Hesperiidæ, whose proper identification we have either shirked altogether, or given up as a hopeless task with the text-books at our disposal. In the long winter evenings, furnished with this new information, we may hope to reduce chaos to order before once more betaking ourselves to the mountains and flowery lowlands which are our own particular happy hunting-grounds across the Channel.

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* Described by M. Daniel Lucas, 'Bull. Ent. Soc. France,' 1910, as a new variety of *serratulæ* from examples taken by himself in the Forest of Vouvant, Vendée. "Almost var. *major*, Stgr."—Oberthür.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 291.)

Lymantria umbrifera, sp. n.

♂. Head, thorax, and abdomen grey, the latter with reddish lateral hairs. Fore wings grey, clouded with darker at base and on median third; transverse lines blackish—subbasal not reaching inner margin; antemedial undulated, rather broad, especially on the costa; postmedial slender, wavy, deeply indented opposite end of cell; submarginal wavy, strongly so towards costa; a black lunule at end of cell, and a black dot in cell near the antemedial line; a series of black dots on the outer margin, placed between the veins. Hind wings fuscous, darker on the outer marginal area, black dot on the margin. Under side fuscous with a pinkish tinge; fore wings with blackish discal suffusion; the hind wings have a black lunule at end of the cell, and traces of two dusky, curved, transverse lines beyond.

Expanse, 44 millim.

Collection number, 32*a*.

A male specimen from Rantaizan (7500 ft.), May 14th, 1909.

Allied to *L. serva*, Fab.

Lymantria nebulosa, sp. n.

♂. Fore wings pale grey, suffused and clouded with darker on outer two-thirds; subbasal line black, not continued to the inner margin, its upper end merged in a blackish dash on the costa; antemedial line black, serrate, slightly oblique, followed by a blackish shade, which reaches the blackish discoidal mark; a short black bar under the discoidal; postmedial line sinuous, whitish partly edged with black; fringes dotted with black. Hind wings fuscous, darker on outer margin; fringes paler.

♀. Fore wings whitish, slightly brownish tinged on the costal and inner marginal areas; subbasal line black, not extending to inner margin; antemedial line black, diffuse on costa, waved, angled at vein one, terminating in a short black bar on the inner margin; postmedial line black, strongly waved, commencing in a black spot on the costa; submarginal line black, lunulate, interrupted; a black dash under the black discoidal mark; fringes dotted with black. Hind wings whitish, suffused with fuscous, darker on outer margin.

Expanse, ♂ 43 millim., ♀ 54–64 millim.

Collection number, 668*a*.

Four specimens from Kanshirei (1000 ft.). One male, April 16th, 1906; another (type), May 24th, 1908; two females, August, 1905.

The April male has the fore wings less distinctly clouded, the transverse lines are very faint, and the outer marginal area is suffused with blackish.

Allied to *L. fumida*, Butler.

Euproctis sericea, sp. n.

Head and body faintly yellowish tinged; anal tuft distinctly yellowish. Wings silky white without markings.

Expanse, 34 millim.

Collection number, 742.

One male specimen from Kanshirei (1000 ft.), November 16th, 1908.

Euproctis nigropuncta, sp. n.

Similar to *E. sericea*, but larger; a small blackish mark at end of the cell of fore wings; anal tuft brown.

Expanse, 40 millim.

Collection number, 742*a*.

One male specimen from Kanshirei (1000 ft.), April, 1908.

Heteropan submacula, sp. n.

♂. Antennæ blackish. Head, thorax, and abdomen brown; collar crimson. Fore wings brown; fringes dark brown, tips paler. Hind wings brown; an obscure, pale, longitudinal streak through cell to outer margin, where it is broadest; fringes pale brown. Under side of fore wings brown with pale ochreous brown patches in and below cell, near apex, and above the inner margin; hind wings pale ochreous brown, fringes dark brown at base.

Expanse, 22–24 millim.

Collection number, 702.

Two male specimens—one from Kanshirei (4700 ft.), May 15th, 1908; the other from Daitozan (8500 ft.), September 14th, 1906. The latter is smaller and darker than the type, the pale streak on the hind wings expands into a blotch beyond the cell, and is more conspicuous; on the under side the whole of the cell of fore wings is filled with pale ochreous brown.

Dasychira olivacea, sp. n.

♂. Head and thorax olivaceous; abdomen darker. Fore wings olivaceous with black transverse lines; subbasal line double, angled below the costa, space enclosed paler shade of the ground colour; antemedial line double, sinuous, preceded by a black cloud on costal area; postmedial line wavy; submarginal line interrupted; lunulated line before the black-marked brownish fringes. Hind wings fuliginous brown, fringes paler at the tips. Under side brown, the fore wings suffused with blackish, except on inner area; all the wings have two, waved, blackish postmedial lines; a dusky discal mark on the hind wings.

Expanse, 44 millim.

Collection number, 668.

A male specimen from Kanshirei (1000 ft.), April 22nd, 1908.

Dasychira taiwana, sp. n.

♂. Antennæ dark brown, shaft greyish; head and thorax pale grey mixed with darker; abdomen greyish, pale at base, darker on anal segments, and tinged with tawny on the middle segments. Fore wings pale grey, clouded and suffused with darker; subbasal and antemedial lines black, wavy, the first only distinct towards the costa, a blackish shade-like band between the lines; reniform mark outlined in black; postmedial line black, strongly waved, followed by a faint blackish shade; submarginal line wavy, interrupted. Hind wings dark fuscous, inner area tawny; a dusky discal mark and traces of a darker, diffuse postmedial line; fringes greyish.

♀. Fore wings pale greyish, with transverse lines as in the male, but the postmedial and submarginal are more clearly defined, and the darker clouds are less in evidence. Hind wings pale fuscous; discal dot and postmedial band dusky.

Expanse, ♂ 56 millim., ♀ 67 millim.

Collection number, 1210*a*.

One male from Arizan (7300 ft.), August, 1908; and a female from Rantaizan (7500 ft.), May, 1909.

Allied to *D. strigata*, Moore, and possibly a local form of that species.

Dasychira arizana, sp. n.

♂. Antennæ reddish brown, shaft whitish; head and thorax whitish grey; abdomen greyish brown, paler at the base. Fore wings whitish grey, clouded and suffused with darker, except at basal fourth and along the costa to the black-outlined reniform mark; subbasal line black, indistinct; antemedial line blackish, double, inwardly shaded with black; postmedial line black, wavy, inwardly edged with clear ground colour, outwardly shaded with darker, followed by a sinuous line of the ground colour; submarginal line black, wavy and interrupted; fringes pale grey chequered with darker. Hind wings dark fuscous, brown tinged on the inner area; discal mark darker, indistinct; fringes paler.

Expanse, 44 millim.

Collection number, 1210.

One male from Arizan (7300 ft.), August, 1908.

Perhaps only a form of *D. taiwana*.

Dasychira (?) *cruda*, sp. n.

Head, thorax, and abdomen whitish, faintly brown tinged. Fore wings whitish tinged with pale brown, obscurely clouded with darker on the outer area; traces of a dark brown subbasal line below costa, followed by an elongate dark brown spot. Hind wings whitish.

Expanse, 37 millim.

Collection number, 661 *a*.

A female specimen reared on April 6th, 1908, from a larva obtained at Kanshirei, which had white tussocks of hair. Found on a rock, March 8th of the same year. The wings are thinly scaled and semi-transparent, owing no doubt to the fact that the imago was not observed for some days in the breeding-cage, and had time to damage itself.

In some respects the insect superficially resembles "*Antipha*" *basalis*, Walk. = *Dasychira mendosa*, Hübn.

Stauropus viridipicta, sp. n.

♂. Fore wings greyish brown, thickly sprinkled with bright green scales on the basal area, and sparingly over the rest of the wing; a dusky mark at end of the cell; transverse lines are not clearly defined, but the postmedial is blackish, wavy, and bent outwards at middle. Hind wings fuscous, darker on the costal area; fringes rather paler, preceded by a dusky line. Under side whitish, suffused with brown.

Expanse, 36–40 millim.

Collection number, 1235.

Two male specimens from Kanshirei (1000 ft.); one taken in May, 1907, the other in May, 1908.

Notodonta griseotincta, sp. n.

♂. Head and thorax dark grey; abdomen brown, mixed with dark grey on the hinder segments. Fore wings dark grey, clouded with brown on basal and outer marginal areas; a black indented mark at end of the cell, preceded by a pale grey cloud; subbasal line black, extending from costa only to middle, where it meets a short black longitudinal and slightly curved streak; antemedial line blackish, wavy, inwardly edged with brown, elbowed near costa, and crossed by a short black streak; postmedial line blackish, serrate, indented near costa, edged with pale grey at costa, and with brown at inner margin, followed by a pale grey point on each vein; submarginal line dark brown, marked with blackish, wavy. Hind wings dark fuscous. Under side dark fuscous; fore wings tinged with brown on costal area, a blackish spot edged on each side with grey beyond middle of costa; a blackish lunule at end of the cell on hind wings.

Expanse, 42 millim.

Collection number, 1795.

One male specimen from Rantaizan (7500 ft.), May 13th, 1909.

Notodonta furva, sp. n.

Fore wings brown mottled with paler; ante- and postmedial lines blackish, diffuse, the former outwardly oblique, the latter elbowed above middle and terminating on inner margin near the antemedial; some blackish streaks on basal and outer marginal areas. Hind wings pale fuscous brown. Under side pale brown; fore wings suffused with fuscous, postmedial line darker, almost straight; a dusky medial line on hind wings, almost parallel with outer margin.

Expanse, 50 millim.

One male specimen from Kanshirei (1000 ft.), April 29th, 1908.

(To be continued.)

NOTES AND OBSERVATIONS.

Entomological Society of London (Conversazione).—We are asked to announce that the Conversazione of the Entomological Society of London, postponed from May last to December, has again been unavoidably postponed until next year. Due notice will be given as soon as a date has been fixed on some day either in May or early June.

Notes on Life-History of Leucania l-album.—In the 'Entomologist' for December, 1909, vol. xlii. p. 322, Mr. E. P. Sharp recorded the capture of a female specimen of *Leucania l-album*. He obtained a few ova. On November 4th he noticed they had begun to turn colour; on the 5th they went quite black and began to hatch in the evening. The larvæ ate up the empty egg-shells and some infertile eggs, but refused any other food, although he tried almost everything. They wandered about, and on being supplied with a section of an old reed stem they promptly entered it, and finding their way into the inner lining commenced to hybernate. The larva was about two and a half mm. in length, of a brownish grey colour, head and plate on prothoracic segment yellowish brown, and it had a few small bristles from tubercles. Mr. Sharp very kindly sent me five larvæ, and on February 22nd I noticed three had come out of the reed and were moving about (the other two had perished). They immediately changed their skins, and when this was over, they at once began to nibble some *Poa annua* which I gave them. Two more died during the second moult, but the remaining one grew up slowly, pupated on June 12th, and produced a fine female on July 14th. Mr. Sharp unfortunately lost all his larvæ. This species is double-brooded on the Continent, emerging in May–June and August–September. I think we may overlook the first brood in this country, as not many people work the south coast then. The larvæ seem hardy enough—mine were kept in an outhouse, facing north, and it was not a particularly mild winter.—H. M. Edelsten; October 12th, 1910.

Notes regarding the Breeding of Chilosia grossa.—In August, 1909, when searching for larvæ and pupæ of *Gortyna ochracea*, I found, in stems of *Cnicus palustris*, some dipterous-looking larvæ, which I fed up on the same thistle. The larvæ eat the pith, and I found them up to two or three feet from the ground. They pupate in the hollow skin at or near the ground level, as I subsequently found pupæ in this situation. This spring I bred from these pupæ two specimens of *Chilosia grossa*, and four ichneumons, which Mr. Morley has kindly identified for me as *Phygadeuon ambiguus* (Grav.).—C. G. NURSE (Lt.-Colonel); Timworth Hall, Bury St. Edmunds.

[The rediscovery of *Chilosia grossa* by Col. Nurse is extremely interesting on account of its economy, and most valuable scientifically, since it was on the highway to the oblivion so many insufficiently described species must inevitably attain, in spite of Taschenberg's details, elaborated by Brischke. My description of both sexes (Ichn. Brit. ii. 93) fits the present example exactly, though the species has never previously been found in Britain, since those upon which it was introduced by Desvignes in 1856 were referable to a distinct species, as I have pointed out (Entom. 1910, p. 172), and those taken by Bignell are very different. Probably our ignorance of the majority of Phygadeuonid hosts is accounted for by their dipterous, and consequently little-worked, nature.—C. M.]

THE GENUS RETINIA IN DEVONSHIRE.—On April 30th, at Woodbury Common, near Exmouth, I found thirty pupæ of *R. turionana* in shoots of *Pinus sylvestris*. This was the result of not much more than an hour's search. They began to emerge on May 17th, and not one failed to produce an imago. The same happy result was obtained last year, and seems to prove that in this locality, at any rate, this species is not subject to ichneumon attack. On the same date, a large number of larvæ were found feeding in the shoots of *Pinus pinea*. These subsequently emerged and turned out to be *R. sylvestrana*. Only six shoots of the pine were taken home, and these produced over twenty insects. As some larvæ were found dead, this confirms the statement that several larvæ feed in each shoot. From shoots of *Pinus sylvestris* in the same locality, *R. pinivorana* and *R. pinicolana* have been bred both this year and last in small numbers. I have not seen a published record for Devon of any of these four species of *Retinia*. Strangely enough, the much commoner *R. buoliana* has not yet been met with. Some larvæ were also found feeding on the dead stems of *P. sylvestris*. One only of these came through, and proved to be *D. abietella*. It may also be worth recording that in the same locality *P. hippocastanaria* occurs, as I see that Barrett does not give any more western county than Somerset and Dorset.—J. W. METCALFE.

ACTIAS SELENE, Hübn., IN BORNEO.—A fine male example of this large Atlas moth was brought into the Museum recently, having been taken in a house on the outskirts of Kuching. As the Museum possessed but a single specimen taken some nine years ago, I thought it must be rather rare in this country. On looking up Sir G. F. Hampson's remarks in 'Fauna British India,' I find the geographical distribution given as "China; throughout India, Ceylon, and Burma"; and apparently it has not been recorded from the Malay Archipelago before. The distribution of the genus *Actias* includes North America, Natal, Japan, and the Andamans, besides the countries mentioned above. Exp. al. 158 mm. This is rather large for a male.—J. C. Moulton; Sarawak Museum, September 12th, 1910.

Note on the Situation of the Pupa, and the Emergence of Cossus ligniperda.—During the past few years I have had the opportunity of observing some numbers of *Cossus ligniperda* just after their emergence from pupæ, and of finding their empty pupa-skins *in situ*. In the great majority of cases, the empty pupa-skins were protruding from the loose, friable earth that had collected in the space between the bottom of the staves of which the fence, on which the moths were drying their wings, was built, and a stout skirting that at some time had been placed along the bottom of the fence; but in two cases the pupa-skins were sticking out from round holes in the staves, and in another from the stout skirting board, through which the larvæ had evidently bored when making their cocoons for final hybernation or pupation. All these were within a few feet of the trees where the larvæ had fed; but one other case is worthy of note as showing the distance to which the larva of this species will travel in order to find a suitable situation for spinning up. Evidently this larva had, when starting on its wanderings, got on to the asphalt path at the foot of the fence, and having reached the end of the skirting board, before finding a soft place, had encountered a brick wall along which it must have travelled for nearly a hundred yards until it found another fence; in the soft earth collected in the corner formed by the junction of the wall and the fence it had made up and from which the pupa-skin was protruding, the moth with wings still limp sitting on the fence just above it. The fences, on which all the moths were found, face due south, and therefore receive the full benefit of the noonday and afternoon sun, and the emergences all took place between five and seven o'clock in the evening.—Robert Adkin; Lewisham, October, 1910.

Forficuline Maternal Care.—The earwig referred to by Dr. Chapman (*antea*, p. 292) is a female specimen of *Anechura bipunctata*, Fabr. It is a mountain species in the palæarctic region; sufficiently common in much elevated districts in summer and autumn. It occurs in South France, Spain, Germany, and Austria at least.—W. J. Lucas.

CAPTURES AND FIELD REPORTS.

Late Date for Cyaniris argiolus.—Following Mr. R. Adkin's note at page 295 upon the late appearance of *Cyaniris argiolus* in Abbot's Wood, Sussex, it may be of interest to report that on September 19th I observed females of this pretty Lycænid, in good condition, flying round the laurestinus bushes of a villa in the neighbourhood of Rennes (Ille-et-Vilaine), the home of one of the sons of M. Charles Oberthür.—H. Rowland-Brown; Oxhey Grove, Harrow Weald, October 7th, 1910.

Cyaniris argiolus at Chichester.—Both broods of *Cyaniris argiolus* have occurred here this year. The earliest date recorded in my diary is May 20th, when I noticed it flying round hollies in the garden. Of the autumnal brood specimens were seen on the wing as late as the third week in September.—Joseph Anderson.

Acronycta alni in Lincolnshire.—On September 17th I took a larva of *Acronycta alni* on the upper side of an oak-leaf in the Pelham's Pillar Wood; and in the same month another larva was taken in Bradley Wood by Mr. F. W. Sowerby, of Cleethorpes. The keeper in Bradley Wood, who pointed it out to Mr. Sowerby, said it had been on the same leaf for the last three days. Both larvæ spun up successfully.—G. W. Mason; Barton-on-Humber.

Daphnis nerii at Sydenham.—A perfect specimen of *D. nerii* was taken at Sydenham on September 24th, 1910, and is now in the collection of Mr. Joicey, Bourne End, Bucks.—A. Noakes; The Homestead, Bourne End, Bucks.

Polyploca ridens Three Years in Pupa.—A fine *Polyploca ridens* emerged in my breeding-cage on March 22nd last, from a number of pupæ obtained in 1907.—Joseph Anderson.

Acherontia atropos in Ireland.—On Tuesday the East Surrey Regiment left Plymouth, where they had been stationed for about two and a half years, for Kinsale. We arrived at Queenstown about 9.30 a.m. on Wednesday, where about half a battalion disembarked. On leaving Queenstown about 12 p.m. the Sergeant Drummer discovered a very large specimen of *Acherontia atropos* running about the deck. I seized it and brought it here with me. It is a very large specimen but much damaged, the left fore wing being nearly without scales. It gave the well-known mouse-like squeak when handled or irritated. This makes the third I have got in the last two years in the British Isles.—Hugh F. Stoneham; (Lieut.) 1st East Surrey Regiment, Kinsale Barracks, County Cork, Ireland.

Eupœcilia udana in Essex.—Referring to Mr. Whittle's note (*antea*, p. 295), it may be interesting to him to know that I have occasionally taken this species in the neighbourhood of Witham, Essex. My first capture of it was in June, 1874.—W. D. Cansdale; Sunny Bank, South Norwood, S.E.

Sesia andreniformis in Gloucestershire.—On July 7th last I had the good fortune to take a specimen of *S. andreniformis* amongst *Viburnum lantana*.—John W. Metcalfe.

Noctua depuncta in Devonshire.—The capture of a fine specimen of *N. depuncta* at sugar, in a wood near Sidmouth, may be mentioned, as it seems to be a rare event in this county. The specimen is much greyer than those I have from the north.—John W. Metcalfe.

Stigmonota pallifrontana and Ephestia semirufa in Gloucestershire.—The capture of two specimens of *S. pallifrontana* at Nailsworth, Gloucestershire, is perhaps of interest. I took them on July 4th and 7th, flying over some kind of vetch. In a garden at the same place I also took this year one *E. semirufa*, on the exact spot where I took a specimen of this species two years ago. Both were flying at dusk near some old ivy, and I have seen no record of its occurrence in Gloucestershire.—JOHN W. METCALFE; Ottery St. Mary.

ACRONYCTA MEGACEPHALA IN OCTOBER.—In 'Moths of the British Isles,' vol. i. p. 193, it is mentioned that *A. megacephala* once emerged on September 10th, from a larva taken on July 11th. It may interest you to know that one emerged to-day (Saturday) from a larva taken, almost fully grown, on August 31st, in the Old Kent Road district of Peckham.—R. EVERETT WARRIES; 6, Lytcott Grove, East Dulwich, S.E., October 10th, 1910.

SPRING BUTTERFLIES IN THE FOREST OF FONTAINEBLEAU, 1910. —I had the good fortune to enjoy a perfectly fine day in the Forest of Fontainebleau on May 27th last, and I write this note in the hope of inducing entomologists to try a day's collecting there in 1911, *en route* for Switzerland or the South of France, or in returning. It makes a long journey much less tedious, and saves much sunlight, given the correct weather. The best plan is to catch the nine p.m. train from Charing Cross, by which you are able to reach the station of Fontainebleau-Avon next morning at 8.30 a.m., leaving Paris from the Gare du Lyon at 7.20 a.m., and this allows for a nice long day in the forest. If proceeding further south, there is a suitable train from Fontainebleau at 5.13 p.m. or thereabouts, which connects at Dijon for south or east; or there is an equally suitable afternoon train from Fontainebleau to Paris to catch the night "Rapides" thence. Arrived at Fontainebleau Station, you are within a few minutes' walk of excellent collecting ground in the forest, which is practically all open ground to the entomologist. As you get out of the train from Paris at Fontainebleau Station, walk back in the direction of Paris, without crossing the line, for a very short distance, then cross the first bridge over the railway and take the first turn immediately to the right, and continue walking by the side of the railway without deviating, until an excellent clearing opens up, facing which, just across the railway, are some large advertisements, too obvious to be missed. It was in this clearing at the edge of the forest that I took a total of eighty-nine perfect examples of the following:—*Pyrgus sao*, *Nisoniades tages*, *Thymelicus thaumas*, *Hesperia malvæ*, *Chrysophanus phlæas*, *C. dorilis*, *Cupido minimus*, *Agriades thetis* (= *bellargus*), *A. coridon*, *Polyommatus icarus*, *P. medon* (*astrarche*),* *Celastrina argiolus*, *Callophrys rubi*, *Nemeobius lucina*, *Iphiclides podalirius*, *Papilio machaon*, *Aporia cratægi*, *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines* (almost equal quantity of both sexes), *Colias hyale*, *Gonepteryx rhamni*, *Brenthis euphrosyne*, *B. selene*, *B. dia*, *Melitæa cinxia*, *M. athalia*, *Pararge*

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* It is interesting, in connection with Mr. Ashby's note on the occurrence of *P. medon* here, to observe that in a recent number of the 'Feuilles des Jeunes Naturalistes' (An. xxxix. sér. iv. p. 24) MM. Guiry and Guignon report the capture by them of var. *artaxerxes* in the Forest of Fontainebleau; but of course it is impossible, without seeing these examples, to say whether they are the real *artaxerxes* of the North Britain form or "approximates." So far as I am aware, there is no record of this form having ever been found in France hitherto.—H. R.-B.

megæra, *P. egeria* var. *egerides*,* *Cœnonympha pamphilus*, besides several interesting specimens of Heterocera, Diptera, and Coleoptera. I intend to revisit the same locality later in the year, in 1911, as I regard it as an excellent ground to commence the study of the butterflies of Fontainebleau. A little farther on by the railway side towards Paris go under the first railway-bridge, which leads you to some excellent glades, where I expect the Nymphalidæ will also be flying gracefully in the height of summer.—E. B. Ashby; 33, Park Road, Whitton, Middlesex.

Acherontia atropos taken at Sea.—It may be worth noting that the Migration Committee of the British Ornithologists' Club have twice had a specimen of the Death's-head moth sent to them, which had been taken at the Kentish Knock Lighthouse, *viz.*, one on May 27th, 1905, and one on September 15th, 1909. This light-vessel is situated well out, off the mouth of the Thames, and is about thirty-five miles from the nearest points of the Essex and Kent coasts. Were these true over-sea migrants? — The Migration Committee of the B.O.C.

Notes from South-west Cornwall.—The following summary of a fortnight's collecting in South-west Cornwall, in July of this year, may possibly be of interest. The locality mainly worked was a small stretch of rocky coast to the east of Cadgwith Cove, about two miles east of the Lizard Point. On leaving London on July 7th the sky was overcast and the temperature low, but as the express carried us westwards the weather improved, and when we reached Cornwall we found blue skies and warm sunshine awaiting us. A visit to a stretch of *Silene maritima* in the evening resulted in a few *Dianthœcia* larvæ, which are no doubt *D. conspersa*. *M. gallata* and *H. serena* were taken flying. The next day was cloudless and hot, so I sought for *S. musciformis* along a sunny and sheltered path on the top of the cliff. A short series of eight was obtained, though it was not always easy to detect the clearwing amid the bewildering mass of insect life that besieged the flowers, and having "spotted" him, it was not always easy to bring off a capture. I hoped to secure a number of this pretty little insect, but evidently I only came in for the tail-end of the flight, as two were taken on the 9th and one on the 10th, after that no more. Sugaring flower-heads in a gap in the cliff on the 8th and 9th only resulted in one or two *Agrotis lucernea* and *A. lunigera*, amongst a host of commoner insects. A dark variety of *Argynnis aglaia* was taken on the 9th. On the 11th, 12th, and 14th, sugared flower-heads along the top of the cliff proved fairly attractive. In addition to a few more *A. lunigera*, *L. putrescens* was taken sparingly, and one *H. umbra*, which I failed to box. Beyond doubt the commonest insect, except *X. monoglypha*, was *L. conigera*, which was in fine condition. *Acronycta rumicis*, *Agrotis porphyrea*, *Hadena pisi* on sugar, and *Acidalia marginepunctata*, *Gnophos obscuraria*, *Acidalia imitaria* taken flying, and *D. conspersa*, seen but not captured, may perhaps be mentioned. About the 14th the weather, which had been good, broke up, and sea-fog, known locally as "dew," held sway for a few days. On the 18th sugar on the cliff again attracted *A. lunigera* (2) and *L. putrescens* (4), with a whole host of common insects. On the 19th trees and flower-heads were sugared, but nothing better than *H. derasa* and *T. batis*, *A. rumicis*, &c., resulted. The 20th, 21st, and 22nd being cold, wet, and windy in the main, no sugaring was attempted. Day-work produced nothing of much interest. The only butterflies seen were *A. aglaia*, *A. selene*, *E. tithonus*, *E. janira*, *C. pamphilus*, *H. sylvanus*, *H. thaumas*, *L. ægon*, *S. semele*, *P. brassicæ*, *P. rapæ*, *P. napi*, *V. urticæ*, and *V. cardui* (worn); and of day-flying moths, *M. stellatarum*, and a female *E. russula* (22nd). Collecting from the seed-capsules of the various kinds of *Silene* resulted in a fair number of *Dianthœcia* larvæ, and other larvæ taken included *S. carpini*, *A. rumicis*, *N. ziczac*, *B. rubi*, and *E. pulchellata*. I did not come across a single colony of *io* larvæ. I might perhaps, even at this late date, record that on August 17th, 1898, I took a fine variety of *P. cardui*, in a clover-field near Cadgwith. It is something like the var. that is, or used to be, figured on the cover of Greene's 'Insect Hunter's Companion,' though, if anything, rather more aberrant. Unfortunately it is somewhat worn.—E. Mannering; 74, Bolsover Street, W.

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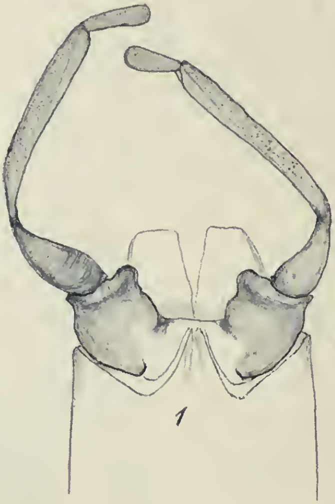
* Probably these would be examples of a second brood, as I found *egerides* quite common in the forest on April 18th, of the by-no-means-forward season of 1909.—H. R.-B.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 5th*, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—The Secretary read the reply to the Address to the King and to Queen Alexandra.—The President announced that the Conversazione postponed from last May was unavoidably postponed until next year. He also exhibited and passed round for inspection an impression of the new seal of the Society, prepared from a design made by Professor Selwyn Image, M.A., Slade Professor of Fine Art in the University of Oxford, and a Fellow of the Society.—Mr George William Vitalli de Rhe Philipe, of Calcutta; and Dr. Charles Ernest Lakin, M.D., M.R.C.S., F.R.C.S., of 2, Park Crescent, Portland Place, W., were elected Fellows of the Society.—Mr. G. C. Champion brought for exhibition two living examples of *Melanophila acuminata*, captured at Woking on September 17th last.—Mr. E. A. Butler exhibited specimens of three species of rare British Hemiptera, *viz.* (a) *Mesovelia furcata* M. & R., and (b) *Cicadula cyanæ*, Boh., both from leaves of *Potamogeton natans* in Epping Forest; and (c) *Cyrtorrhinus geminus*, Flor., from Broxbourne—a recent addition to the British list. He also exhibited living examples of *Mesovelia furcata*, and drew attention to the extraordinarily rapid movements of the species, which quite defy the eye.—Mr. A. H. Jones showed a series of *Pieris manni*, males only, from the valleys of the lower slopes of Mont Canigou, near Vernet-les-Bains, taken at the end of June last, with examples of *P. rapæ*, and *P. ergane* from Italy for comparison.—Mr. P. J. Barraud brought for exhibition a case containing Pieridæ from the neighbourhood of Formia, Central Italy, including *Pieris rapæ*, L., and var. *metra*, Stephens; *Pieris manni*, Meyer, and var. *rossii*, Stefanelli, and ab. *erganoides*, Stefanelli; and *Pieris ergane*, Hübn. With these examples he showed also enlarged photographs of male and female specimens of the summer forms of the above-named species to illustrate the difference in the character of the markings and shape of the wing.—Commander J. J. Walker exhibited (*a*) a "co-type" of *Austrostylops gracilipes*, Lea., from Bridgetown, W. Australia; (*b*) a series of *Carabus violaceus*, L., var. *exasperatus*, Curtis, taken by Mr. F. C. Woodforde, at Bude, where this race appears entirely to replace the ordinary form of *violaceus*; and (*c*) four examples of *Hæmonia appendiculata*, Panz., taken near Kidlington, Oxon, August, 1910; also (*d*) a specimen of *Cryptophagus subdepressus*, Gyll, from Wytham Park, Berks, with the right antenna duplicated from the third joint.—Mr. W. F. H. Rosenberg showed a living beetle of the genus *Alindria*, received in a collection of preserved Coleoptera from Abyssinia. The insect has the habit of simulating death on being alarmed, which probably accounts for the collector having packed it up without noticing that it was alive.—Mr. H. St. J. Donisthorpe exhibited two nests of ants to illustrate his observations on the founding of nests of *Formica rufa* by a female of that species in nests of *F. fusca*, and also made some remarks on the association in nature of *F. rufa* and *F. exsecta*.—Mr. J. W. Tutt brought for exhibition a fourth British example of *Xylophasia zollikoferi* sent him for determination, taken in September, 1905, at Norwich, by Mr. Plunkett.—Dr. T. A. Chapman exhibited several cases containing series of *Agriades coridon*, var. *meridionalis*, Tutt, male (= *constanti*, Reverdin), and gave an account of his breeding experiments made to show that this form is double-brooded.—Mr. J. W. Tutt said the Rivieran race of *A. coridon* was exceedingly interesting, as providing the only case recorded where the species is certainly double-brooded. He also gave an account of the geographical distribution of the species, and the differences of marking in the various races.—Mr. G. Meade-Waldo exhibited an example of the Mantis *Hymenopus bicornis* in the larval state, and read a note on the subject of the "praying" attitude communicated by Mr. J. C. Moulton.—The Rev. G. Wheeler gave an account of an entomological excursion made by him this summer in the Abruzzi, and exhibited two drawers containing specimens taken at Assergi, Sulmona, Aquila, Roccaraso, Palena, Scanno and Villalago; and a few also from Subiaco in the Latian Apennines.—Mr. E. Dukinfield Jones brought for exhibition lantern slides of Lepidoptera in natural colours, photographed by the Dufay Dioptichrome process. The advantages over other plates, he said, were the greater transparency and the facility of working: they were, in fact, very little more trouble than an ordinary negative.—Miss Margaret E. Fountaine communicated a paper on "Descriptions of some hitherto unknown, or little known, Larvæ and Pupæ of South African Rhopalocera, with Notes on their Life Histories."—Professor A. Jacobi communicated a paper, "Remarks on the Cicadoid Genera *Lambeja*, Dist., and *Drepanopsaltria*, Bredd."—Mr. Arthur M. Lea communicated a paper, "On the new Genus of *Stylopidæ* from Australia."—H. Rowland-Brown, M.A., *Hon. Sec.*

The Entomologist, December, 1910. Plate VI.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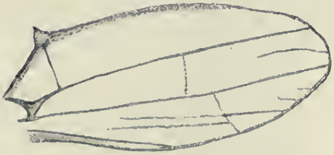
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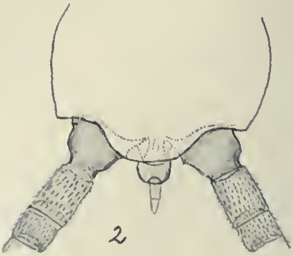
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K. J. M. del. West, Newman proc.

BAËTIS CARPATICA, N. SP.

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A NEW SPECIES OF *BAËTIS* (EPHEMERIDÆ) FROM THE EASTERN CARPATHIANS.

By Kenneth J. Morton, F.E.S.

(Plate VI.)

Mr. Josef Dziedzielewicz, Gerichtsrat (retired), in Lemberg, a zealous student of the Neuroptera of his country, who has added a number of most interesting new species to our knowledge of the fauna of the Eastern Carpathians, some time ago sent to me a representative collection of the Ephemeridæ for confirmation by the Rev. A. E. Eaton. Mr. Eaton very kindly examined the collection and made a most useful report, but at the time circumstances did not admit of his undertaking the publication of anything concerning them.

Included is a species of *Baëtis* which was not known to Mr. Eaton, and which is apparently new. At the request of the discoverer I now describe it as

Baëtis carpatica, n. sp.

Imago (dried) ♂. Notum mainly piceous, sometimes with paler sutures and paler sides. Dorsum of abdomen brown passing to brownish piceous at the apex. Metasternum and abdomen beneath and the setæ paler. Forceps with the large basal joints fuscous or blackish, the other joints fuscescent. Wings hyaline, with brownish neuration, faintly amber-tinted, slightly darker in the costal region.

♀. Almost entirely brown above; three terminal segments beneath pale yellowish.

Length of fore wing: ♂, 10–11 mm.; ♀, about 13 mm. Length of caudal setæ of ♂ about 22 mm.

Loc. In the region of Chomiak, in the Eastern Carpathians (a peak in the "Flussgebiet" of the Prut, 1544 metres).

Explanation of Plate.—1. Apex of abdomen from beneath. 2. Apex of abdomen from above. 3. Hind wing of male (nat. length, 2·75 mm.).

NOTES ON A BUTTERFLY HUNT IN FRANCE IN 1910.

II.—In the South-East.

By H. Rowland-Brown, M.A., F.E.S.

(Continued from p. 303.)

Leaving Samoussy on June 27th, and travelling by Laon, we took the night express from Paris for Lyons and the south, arriving at the junction of Pierrelatte about eleven o'clock of such a clear blue day as we count upon in the Midi at this time of the year. With three hours to wait for the Nyons "parliamentary," we were glad to take our *déjeuner* under the oleander-shaded verandah of the little inn which seemed for the nonce to be tenanted chiefly by flies! Later in the day we completed the last stage of a decidedly long journey, and covered the remaining twenty miles or so in about three hours! The afternoon heat was terrific, and, as the coaches are invariably shunted in the blazing sun, ours was suffocating with its low-down roof, against which the head of my companion was continually brought in contact. Prospecting a new line of country, however, is always an agreeable occupation, entomologically speaking, and as we approached the limestone stone hills—the far-flung outposts of the Central Alps—we saw our first Satyrids—plenty of them—males of *Satyrus hermione*, and *S. circe* flying by the side of the railway, and had we been so minded I do not think a descent from the train in motion would have left us too far behind to resume our seats after a leisurely bottling of such examples as we might have wished to secure! But it was the true Midi—that was some consolation—with its almond trees, grey slanting olives, and burnt-ochre fallows: its white villages sheltered by hedges of laurestinus and tamarisk, with here and there the lofty spires of funereal cypress piercing the universal blue. Dry watercourses and stunted forests of ilex-oak, with tufts of lavender still unflowered, suggested also the southerness of the department of the Drôme, though I was quite unprepared for the further proof of this we were presently to experience among its butterflies.

Nyons is a very old-world picturesque town built in a sword-cut in the surrounding hills where the Eygues has cleft a way through from the mountains to the wide valley of the Rhône. Our most comfortable Hôtel-Colombiers at some time of remote history had been evidently a castle or a monastery, with its vaulted rooms and three-foot walls of solid stone. On the front it opened upon the public square, where until far into the night a company of strolling players screamed through interminable dramas, which never failed to draw good "houses," largely due to the fact that the majority of seats, being *al fresco*, were free!

But there were no fire-flies as I have seen them even higher up at St. Martin-Vésubie, and an extraordinary absence of Noctuids round the many electric lights. The restaurant of the hotel opened at the back upon an extremely Italian arcaded market-square, where three times a week a brisk business was done in silkworm cocoons, piled waist-high in primrose-coloured pyramids under the arches, and the gay umbrellas of the merchants.

In the late sunlight a few *Polygonia egea* were still fanning their wings on the roadway. The Diptera of Pierrelatte were, however, pleasantly conspicuous by their absence, and I may add that never once in the whole of July did we suffer the torment and inconvenience which in normal seasons the collector in the Midi may not hope to escape. We counted no fewer than fifty species of butterflies next day—June 29th—on our first expedition, following up the well-wooded, bamboo-fringed stream which falls into the main river half a mile, perhaps, away across the Roman bridge on the left bank. Again we encountered isolated examples of *P. egea*, and there was a long torrid wall facing the sun which we presently found to be much affected by this handsome "Comma." Yet it is a very hard butterfly to catch, and after many years' collecting I have still but a meagre series of decent specimens.

Following the watercourse amid luscious scented brooms and tall green rushes, we found a few battered *Melitæa deione* of the first brood, and evidently almost ended. *Cœnonympha arcania*, in contradistinction to the Samoussy race, was but freshly emerged, while *Hesperia sao*, *Thymelicus actæon*, and *T. lineola* were in the pink of condition. *M. athalia*, much lighter than those of the north, was also common, and most abundant of all *Rusticus ægon*; while of the other "blues," *P. bellargus* was nearly over, *P. hylas*, males and females superb, with equally resplendent *P. escheri*. And then the surprises began, Mr. Warren, who was in front, bidding me come and look at a wonderful Swallowtail which had fallen to his net. This was, of course, *Papilio alexanor*, though I could hardly believe my eyes; while a minute later I was busy with a perfectly fresh male example of *Epinephele pasiphaë*, presently found to be one of the commonest butterflies on the wing—all the more remarkable because at Hyères *pasiphaë* is an early May insect, and here were we on the threshold of July! After this I was prepared for anything in the way of true southern species, but still not for the two females of that loveliest of Lycænids, *Lycæna iolas*, secured by Mr. Warren, nor for the single *Polyommatus admetus* var. *rippertii*, the only one met with in the Drôme, which I took from a spike of lavender.

Evidently *L. iolas* only wants looking for to turn up in a much wider area than it is now known to inhabit in France. Between its most northerly habitat in the well-known Sierre locality and the *Colutea*-clad slopes of Digne, the heaths of Aixen-Provence, and the hot hills of the Bouches-du-Rhône, there are plenty of likely spots still wholly unexplored. But it is evidently a species requiring meridional heat for successful development, and just as it has not yet been reported west of the Rhône, I fancy Nyons will be found essentially to be its "furthest north" in this direction. And the same remark, no doubt, is applicable to *P.* var. *rippertii*, common enough in certain parts of the Basses-Alpes and the Alpes Maritimes, but hitherto reported by no collectors or writers west of the Durance Valley. Had we stayed on at Nyons later than we did, it is probable that we should have found it, the single male being obviously a precocious emergence. That it should be absent from Lozère—a country in many aspects exactly reproducing the eastern Rhône region—is also remarkable. Dr. Kane, I know, gives Lozère ('Handbook of European Butterflies,' p. 47), following Duponchel, who recorded a single female specimen from the Val d'Arriges Florac, or Berce, who incorporated Duponchel's statement without investigation. But M. Oberthür, in his last volume of 'Lépidoptérologie Comparée' (fasc. iv. pp. 257–8), leaves us in no doubt that Duponchel was mistaken; while I myself have twice collected in the Cévennes, in this locality, and so has Mr. A. H. Jones, without coming across anything but the female of *L. damon*, so easily confounded in the cabinet with *rippertii*, but in the field occurring quite a fortnight later than the last laggard of that species.

Another welcome capture was *Cœnonympha dorus*, the males becoming commoner and commoner every day; *Chrysophanus alciphron* var. *gordius* was not rare; and Mr. Warren took an unexpected male of the female ab. *midas*, Lowe, with *Cupido minimus*. Survivals of the first brood of *C. sebrus* were also in evidence, with occasional isolated specimens of *Carcharodus lavateræ*. Once or twice also a vision of *Gonepteryx cleopatra* greeted our eyes, and it was interesting to identify on the wing for the first time the much-discussed *Pieris manni*, now unanimously "gazetted" to the rank of a true species. A few *Limenitis camilla* skimmed over the willows of the brook, where also *Leptosia sinapis* and male *Celestrina argiolus* moved restlessly from tree to tree. A fine light form of *Pararge egeria* haunted the shadier side of the valley, but by far the commonest butterfly on the wing was *Melanargia galatea* var. *procida*. Of these Mr. Warren took an interesting series, several individuals of which came as near to Ochsenheimer's ab. *galene* as any French specimens I have examined.* *Thecla ilicis* swarmed on the bramble-blossoms, and with them, worn and much less frequent, *T. acaciæ*.

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* The tendency to local variation with this butterfly within extremely restricted areas is very curious. M. Postel (*in litt.*) tells me that *M. galatea* occurs throughout the department of the Somme, but at Mailly-Maillet he has never met with the typical female of Guenée, which is common enough on the cliffs of Tréport and Mesnile Val (towards Dieppe). "The female of the Upper Somme is the ab. *galene*, Ochs., with all the intermediates."

To all appearances the weather had now settled, but in the night there was a change, and thenceforward the summer seemed to have taken wings. After a tremendous thunderstorm about ten o'clock next morning a walk up the Mirabel road revealed two broods of *Polyommatus corydon* overlapping, for we took very broken and old females flying with quite fresh male examples; Nyons, no doubt, with Mont Ventoux, producing the gen. *vernalis*, of which so much information has been recently made available by Dr. T. A. Chapman (Proc. Ent. Soc. Lond. 1909 and 1910), Dr. J. L. Reverdin, of Geneva, and Mr. J. W. Tutt. Flying about the low ivy-covered walls, *E. pasiphaë* was also not uncommon, but it is a short-lived insect, and before we left Nyons the females were already wasted.

A French engineer, who happened to be in the hotel, having informed us that *Papilio alexanor* was flying on the hills above les Pilles, six kilometres higher up the river, and presented us with a match-box containing two hopelessly damaged yet still living males, we made this the objective of our walk on July 1st. But the weather was overcast, and the long dusty road yielded literally nothing beyond a few *Pontia daplidice*. Nor did we encounter *alexanor* at the spot indicated, and returning on the opposite bank of the Eygues by midday had taken nothing worth recording, except two beautifully fresh and strongly marked *Anthrocera rhadamanthus*, a fine southern Zygænid not met with again. But after lunch, finding ourselves back at the entrance to our valley of June 29th, we again ascended, and late in the day, on one of the many grassy footways for the use of the foresters through the hillside woods, Mr. Warren came upon what we afterwards found to be the headquarters of *P. alexanor*. Here on the white melilot and scented scabious-heads this beautiful butterfly occurred not infrequently with occasional *C. lavateræ* and females of *G. cleopatra*, and Mr. Warren took a single example of the essentially southern *Anthrocera lavandulæ* ab. *consobrina*, Germ. A tuft of early-flowering lavender also provided the first perfect example of *Lycæna arion*, while in the lower meadows a very fine bright form of *Chrysophanus dorilis*, with fresh *Issoria lathonia* and *Melitæa phœbe*, divided attention with several pretty specimens of *M. galatea* ab. *leucomelas*. The weather of July 3rd and 4th was entirely against collecting: cloud and wind and heavy thunder-rain, a long expedition in the hills to the north-west, returning by the cart-track, which is also for the most part the rough river-bed of a stream, past the tumble-down towers of Aubres, resulting in practically no captures. A final visit to the *alexanor* ground on the 5th, under same conditions, being hardly more successful, we determined to change our ground again, and try the old familiar hunting-grounds of the Basses Alpes.

Accordingly, on the 6th we packed up our things, and drove to Serres in the Hautes-Alpes, some sixty-five kilometres to the east, the nearest point on the line from Grenoble to Digne, and, the morning being fine until about eleven o'clock, we spotted not a few *alexanor* on the precipitous cliffs and rough stony slopes which characterize the whole intervening country until the defiles of St. May, with its imposing ruins, are passed. By midday we had reached Rosans (Hautes-Alpes), and while waiting for *déjeuner* took advantage of a momentary gleam of sun to unfurl our nets. *Eugonia polychloros* was now observed, while a piece of rough ground near the village we found teeming with butterflies, principally a form of *Hesperia alveus*, *Melitæa phœbe*, *M. didyma*, and *P. corydon*. But we were not so fortunate as Dr. Vogt, of Paris, who followed us with M. Guerry, of Roanne, two days later, and took quite a number of the rarest of French Melanargias, *M. iapygia* var. *cleanthe*, not hitherto reported from the Hautes-Alpes, but apparently occurring throughout the hot uplands among the corn-fields, just as I found it some years since under precisely similar conditions on the arid Causse Méjean above Florac, in Lozère. From Rosans to Serres is but a matter of twenty-four kilometres, and collectors in search of *cleanthe*, who have hitherto failed to reach its other known headquarters by reason of the difficult approach to the Montagne de Lure from Sisteron, would do well to make a halt at Serres on their way south, and spend a day or two at the homely Rosans inn, which provided us with an excellent repast, and seemed well adapted for not too-exacting *pensionnaires*. As far as I can gather there is also decidedly promising country for the entomologist all round Serres, which, like Nyons, is well within the line dividing the Midi from the north of France. Meanwhile, as the Drôme appears to have received little attention from lepidopterists, and the late M. Rouast, of Nyons, author of a 'Catalogue des chenilles européenes connues,' published at Lyons in 1883, who lived some time at Nyons, left no record of his work in this particular locality, I venture to add in detail a list of all the butterflies observed by Mr. Warren and myself during our visit to the southern part of the department, June 28th to July 6th:—

Hesperiidæ.—*Carcharodus lavateræ*, *C. alceæ*; *Hesperia alveus* (Rosans), *H. malvæ*; *Pyrgus sao*; *Pamphila sylvanus*; *Thymelicus actæon*, *T. lineola*, *T. flavus*.

Lycænidæ.—*Chrysophanus alciphron* var. *gordius* (one ab. *midas*, male, taken by Mr. Warren, July 3rd); *C. dorilis*, *C. phlæas*; *Lycæna arion*, *L. iolas*; *Cupido minimus*, *C. sebrus*; *Nomiades semiargus*; *Polyommatus admetus* var. *rippertii*, *P.*

corydon, P. bellargus, P. hylas, P. escheri, P. icarus, P. medon (*astrarche*), *P. baton ; Rusticus argus, R. argyrognomon ; Celestrina argiolus ; Thecla ilicis, T. spini, T. acaciæ.*

PAPILIONIDÆ. — *P. podalirius* ab. *zanclæus, P. machaon, P. alexanor ; Aporia cratægi ; Pieris brassicæ, P. rapæ, P. manni* (Mr. Warren informs me that all the "whites" brought home by him are referable to this species) ; *Pontia daplidice ; Leptosia sinapis*, and ab. *erysimi ; Colias hyale, C. edusa ; Gonepteryx cleopatra.*

NYMPHALIDÆ.—*Dryas paphia ; Argynnis aglaia, A. adippe ; Issoria lathonia ; Melitæa phœbe* (and Rosans), *M. didyma, M. deione, M. athalia, M. parthenie* (one) *; Pyrameis cardui, P. atalanta ; Eugonia polychloros* (and Rosans) *; Polygonia egea, P. c-album ; Limenitis camilla.*

SATYRIDÆ.—*Pararge mæra* var. *adrasta, P. megæra, P. egeria ; Satyrus hermione, S. alcyone, S. circe ; Hipparchia semele ; Epinephele jurtina* and var. *hispulla, E. pasiphaë ; Cænonympha arcania, C. dorus, C. pamphilus ; Melanargia galatea* var. *procida*, ab. *leucomelas*, ab. *galaxæra*, Esp., and trs. ad ab. *galene*, Ochs., and *M. iapygia* var. *cleanthe* (Rosans, Dr. Vogt).

Before concluding this paper I should like to draw the attention of British "travelling" collectors also to the possibilities of the country immediately south of our little area of occupation. From several of the higher hills in the vicinity we could see Mont Ventoux, the last "alp" of any size west of the central chain ; our French friends in a motor-car actually did a whole day's collecting there from Nyons. During the past few years my friend Mr. Henry Brown, of Paris, has worked assiduously both on the northern and southern slopes of this extremely interesting mountain, which seems to combine the southern fauna of the plains with not a few of the butterflies associated with the higher Alps. At some future time I hope to deal exhaustively with the Rhopalocera of the beautiful, and entomologically fertile region, east of the Rhône valley, bounded on the north by the Isère and the Drac ; on the south by the Verdon and the Durance. Meanwhile, it is an encouragement to closer investigation to know that Vaucluse maintains a butterfly fauna hardly less rich and varied than that of the Mediterranean littoral itself, for while the lower elevations yield such characteristic meridionals as *Thais rumina* var. *medesicaste, Euchloë euphenöides, Leptosia duponcheli, Libythea celtis, Nomiades melanops*, and *Lampides telicanus*, on the mountain itself occur, besides *Erebia epistygne, E. scipio* (at 1500 m.), *E. neoridas, E. evias*, and *Parnassius apollo.*

(To be continued.)

THE NUMBER OF LARVAL INSTARS OF *CYANIRIS* (*LYCÆNA*) *SEMIARGUS*.

By T. A. Chapman, M.D.

I ought, perhaps, to say a word in elucidation of Mr. Frohawk's paper in the 'Entomologist' for November (p. 305). Mr. Frohawk had a larger number of larvæ surviving in the spring than I had, so that the presumption is in favour of his being able to make more satisfactory observations, as I could not afford to take undue liberties with my examples.

The discrepancy between us is not as to the autumnal history, where, Mr. Frohawk very truly says, observation is often difficult—we agree that hybernation takes place in the third stage. If I am in error, I missed a spring moult, which is not impossible, owing to my scanty material, though it is not out of place to say that this rendered me very unlikely to confound one specimen with another—and I kept a very close watch on my specimens.

On the simple question whether Mr. Frohawk or I have fallen into error, I think the probabilities are in favour of the lapse having been on my part. Though variation in the number of moults is by no means uncommon in many Lepidoptera, I cannot remember any butterfly clearly proved so to vary, and, certainly so far as my experience goes, no Lycænid; still, it is of course possible.

That I am perchance right has a rather weak support from the fact that most Lycænids have five stages, not a few only four. I cannot at the moment remember one with six, but this is no reason why *L. semiargus* should not have six.

There is, however, one very important point that convinces me that my observations are correct. It is one with which I did not supply Mr. Tutt; indeed, I fear I too often do not make my notes for his use so complete as they ought to be.

This point is one I have worked out in a number of species, and always found it determine correctly any case of doubt like the present as to number of moults. Whatever may be the case in such instances as *Arctia caja*, where the number of moults varies in different individuals to a great extent, apparently to meet various exigencies arising in hybernation, I find, wherever the number of moults is constant, that the size of the larval head after each moult shows a constant percentage of increase on that of the head in the preceding instar.

Now, on looking up my preserved specimens of larvæ and larva-skins of *L. semiargus*, and measuring as closely as I can the heads at each stage that I have preserved, I find the following results. The measurements are from the base of the jaws to the vertex, as I found that this was the easiest measurement to take on my specimens, having regard to the necessity that it should be the same as nearly as was possible in each specimen.

From base of mandible to vertex:—

In first instar	0·16 mm.	In fourth instar	0·51 mm.
,, second ,,	0·24 mm.	,, fifth ,,	0·81 mm.
,, third ,, (hybernating instar)	0·36 mm.		

If we assume that the increased size of the head at each moult in the case of *L. semiargus* is as 3 to 2 (fifty per cent.) in linear measure, we find we can construct a series thus:—

First instar	0·16 mm.	Fourth instar	0·54 mm.
Second ,,	0·24 mm.	Fifth ,,	0·81 mm.
Third ,,	0·36 mm.		

I certainly did not expect the actual measurements and the calculated ones to agree so closely; that, I think, is a matter of (fortunate) accident. There might have been considerable discrepancies, and yet the point to be shown would have remained equally clear. It is obvious that no further instar could be interpolated without entirely destroying the regular rate of growth that obtains in all such cases.

I don't know whether Mr. Frohawk's last paragraph is intended to suggest that error underlies most observations as to variations in the numbers of moults, notwithstanding his immediately preceding appreciation of Mr. Merrifield's lecture; if so, it is obvious that Mr. Frohawk's work amongst the butterflies, where, I believe, his view would be, so far as I know, quite correct, should not lead him to generalize in the same sense; anyone working only with Arctiids might plausibly assert that there are no fixed stages in lepidopterous larvæ.

ON THE VARIATIONS OF *AGRION PUELLA*, Linn.

(Odonata.)

By F. W. & H. Campion.

The colour characters of *Agrion puella* are, in both the sexes, subject to a considerable amount of variation, and most, but not all, of the aberrant markings which occur in the species impart to the individuals exhibiting them a more or less close resemblance to the nearly related species *A. pulchellum*. The most striking resemblance of this description is borne by the variations of the male and female which are numbered herein 3 and 2 respectively. There can be little doubt that these two forms have been sometimes mistaken for the species which they simulate, and it may be remarked that both sexes of *pulchellum* tend to vary in the direction of *puella*. But of course in all their disguises the two species can be readily identified by anatomical characters, such as the form of the posterior margin of the prothorax, and, in the male, the structure of the anal appendages.

The following are the principal variations which have come to our notice:—

MALE.

Variation 1.—In discussing the female forms presently, we shall have occasion to mention a specimen in the De Selys-Longchamps Collection without antehumeral blue stripes; this aberration finds a parallel in the sex now under consideration in two very aberrant males which we took in Epping Forest on July 22nd, 1905, and which also lack antehumeral stripes.

Variation 2.—Notwithstanding De Selys' declaration concerning this and some other species that "la répartition du noir sur le premier segment est aussi très-fixe et d'un grand secours pour la détermination," we have found that the basal black spot on segment 1 of the abdomen is liable to some variation both as to shape and size. The posterior edge may be almost straight instead of rounded, and may touch the black ring at the apical suture at one or more points.

Variation 3.—The U-shaped marking on the second segment may be connected with the posterior circlet, as in *A. pulchellum*. In the 'Entomologist' for 1906 (p. 278) we recorded the capture in Epping Forest in that year of four males exhibiting this variation, and in 1907 we took a similar male at Byfleet, Surrey (Entom. xl. p. 213), and another at Hartford, near Huntingdon (*ib.*, p. 257). Mr. E. R. Speyer has been so good as to send us a fine example of the same description taken by himself in a Sussex locality on August 3rd, 1908. Furthermore, Mr. K. J. Morton is kind enough to inform us that he possesses a male of *puella* from Austria with the second segment marked as in *pulchellum*, or rather as in *A. ornatum*. It appears from a footnote on pages 165 and 166 of De Selys' Monog. Libell. Eur. that Fonscolombe had lately reported a variety of this kind from Provence, but that De Selys was unacquainted with it, and was not prepared to accept the correctness of Fonscolombe's identification without further investigation.

In Mr. Speyer's Sussex specimen the connecting longitudinal black line is as strongly marked as it is in normal *pulchellum*, but in most of the other examples which we have examined the connection has been slender, and has exactly corresponded with a condition not infrequently occurring in *pulchellum*, in which species the connection varies considerably in strength, and may be wanting altogether.

The variations in the shape of the spot on the second segment, numbered 4, 5, and 6, are represented in the De Selys Collection, at Brussels, and the specimens are labelled "Lch.," no doubt an abbreviation of Longchamps, the name of De Selys' home near Liège. Variations 4 and 5 are also figured by De Selys in Bull. Acad. Brux. x. (2) p. 162, fig. 3 (1843).

Variation 4.—Sometimes the lateral branches of the spot are entirely separated from the transverse line; this modification resembles the spot in *A. lunulatum*, male, and also in an analogous variation of *A. hastulatum*. Another specimen of this variety was taken by Mr. H. J. Watts at Lechlade, Gloucestershire, on June 15th, 1910, and is now, through the courtesy of Mr. Watts, in our own collection.

Variation 5.—More rarely the transverse line is strongly interrupted in the middle, and the spot then consists of two distinct portions.

Variation 6.—Again, the transverse line may carry a third branch, lying in the median position between the usual lateral branches; the spot is then converted into a trident. A male taken by ourselves in Epping Forest on July 14th, 1901 (Entom. 1902, p. 37), exhibits a similar variation, as well as other abnormalities, but in that specimen the trident-mark is neither so clear nor so symmetrical as it is in De Selys' beautiful example.

Variation 7.—The figure of Charpentier's *Agrion furcatum*, male (=*A. puella*, Linn.), in 'Libellulinæ Europææ' (pl. xl.), shows the U spot connected with the posterior circlet by two widely separated curved lines. It is true that in this respect the figure is in conflict with the description—"[Segmentum] secundum macula furciformi, cum margine postico nusquam cohærente" (p. 158)—and that De Selys characterized it as "inexacte," but we have at least two males agreeing fairly well with the figure.

Variation 8.—The proportions of blue and black in the coloration of segment 6 vary a good deal, and the segment may be mostly blue or mostly black.

Variation 9.—The petasus-like black spot on segment 9 occasionally undergoes a good deal of change in shape and size; sometimes, for example, it may nearly cover the entire segment, and at other times it may be represented merely by a pair of separate lateral comma-like marks.

Cases are not infrequent in which supernumerary black dots and lines, irregular in outline and position, appear upon various parts of the abdomen. Such markings seem to be of a more accidental character than the variations previously considered, and may be so numerous as to cause a more or less general blackening of the insect, as in the cases recorded by us in Entom. 1909, p. 294.

Female.

Variation 1.—As we have said already, the De Selys Collection contains a remarkable female, in which the antehumeral stripes on the thorax are practically obsolete. According to the labels attached to it, the specimen is unique, and was taken at Dolhain, in Belgium. The aberration is thus described by De Selys:—"J'ai pris une seule fois une curieuse aberration, chez laquelle les deux bandes jaunes antéhumérales étaient oblitérées, réduites à une petite tache basale au bord mésothoracique" (Bull. Acad. Belg. (2) xli. p. 1259, 1876).

We have a single female in which the antehumeral stripes are present, but interrupted as in normal *pulchellum.* The specimen was taken at Staines on May 22nd, 1910, at a pond yielding both *puella* and *pulchellum*, but we refer it to the former species by reason of the shape of the prothorax.

Variation 2.—A pair of conspicuous cuneiform green or blue spots may occur on abdominal segments 3, 4, 5, and 6; smaller spots of the like kind may be repeated on segment 7, and sometimes on segment 8. The normal thistle-spot on the second segment is not infrequently replaced by a mercury-spot. One of the descriptions of this variety written by De Selys is in the following terms:—

"La répartition du bronzé sur l'abdomen est aussi sujette à une variation analogue à ce qui existe chez le *pulchellum*, avec cette différence que, la variété la plus commune chez le *pulchellum* est la plus rare chez la *puella.* Voici l'indication du dessin chez un individu où il s'écarte le plus de la femelle type que j'ai décrite plus haut: 2^e segment bleu, avec une tache trifide en avant bronzée (dans le genre de celle du mâle de l'*A. mercuriale*) touchant le bord postérieur; 3^e, 4^e, 5^e et 6^e segments, avec une tache dorsale, basale, bleue, bifide en arrière, occupant le quart ou le tiers du segment. Le 8^e avec une tache semblable occupant sa moitié antérieure et le bord postérieur de même couleur.—Ces taches peuvent être vertes, blanchâtres ou aunâtres" (Rev. Odon. p. 202).

A specimen preserved in the British Museum Collection carries three labels, as follows:—"Agr. puella var. ♀ annulatum," "$\frac{46}{122}$," and "369." The first is a large oblong label in De Selys' own handwriting, but the others are printed labels, and reference to the Museum Register shows that the specimen is a Belgian one and was presented by De Selys, with other dragonflies, late in 1846. So far as we can ascertain, the name *annulatum* was never published, and it is possible that De Selys refrained from doing so in consequence of the varying extent to which different individuals of the variety approximate towards *pulchellum.*

The variety cannot be accounted a rare one. In addition to taking it in Epping Forest in 1904, 1908, and 1909, and in

Huntingdonshire in 1907, we have seen specimens from Sutton (Mr. W. J. Lucas, 1896), and Ockham Common (Mr. Lucas, June 23rd, 1900), Surrey; from Staines, Middlesex (Mr. H. J. Watts, June 13th, 1909); and from Hever, Kent (Mr. G. Meade-Waldo, June 18th, 1910).

The cuneiform spots are always present on segments 3 to 6; they are often repeated in an abbreviated form on segment 7, and occasionally on segment 8 also. When the spots extend from segments 3 to 8, as they do in the De Selys specimen, the two examples in Mr. Lucas' collection, and the specimen received from Mr. Meade-Waldo, the normal condition subsisting in the corresponding form of *pulchellum*, female, is exactly reproduced.

In some examples of the variety the cuneiform spots are green, whereas in other examples they are blue. It is not quite clear whether one colour passes into the other in time, or whether, as we are inclined to think is the fact, the green or the blue, as the case may be, remains unchanged throughout the life of the insect. We have never met with an individual whose coloration was of a transitional character, and we possess both a green-spotted specimen and a blue-spotted specimen which are so fully matured that the supposition that any future change of coloration might have taken place in those particular instances seems to be excluded. As to the dates of occurrence, we have so far taken green-spotted females in the month of July only, but our captures of blue-spotted females have ranged from June 21st (1908) to August 22nd (1909), and have therefore been earlier as well as later in the year than our captures of the green females; it has been already mentioned that the Hever female, which is also blue, was taken on June 18th (1910).

The superficial resemblance of this insect to one of the forms of *pulchellum*, female, is at all times very close. But when, as sometimes happens in the same individual, a mercury-spot is present on segment 2 and the cuneiform spots reach to the eighth segment, that resemblance is so much enhanced that it constitutes a very fertile source of confusion. Curiously enough, however, Stephens mistook the variety for *Agrion hastulatum*, as we learn from a specimen in the British Museum labelled "*hastulatum*, Charp.," and taken from his collection.

Now and again females of *puella* are found with the normal green ground colour replaced by blue on the anterior parts of the body, such as the postocular spots, the thorax, and the basal segments of the abdomen. Cases of this description, however, cannot be regarded as varieties, and the females of several other species of Odonata are apt to assume the andromorphic dress, especially in advanced life.

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THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 262.)

The information at my disposal with regard to the earlier stages of this group is so fragmentary that I hardly know whether it is worth offering; still, so far as it goes, it may help towards the elucidation of some doubtful points. There are but two species with the eggs of which I am acquainted, *parthenie* and *aurelia*. Excellent photographs of them were made by Mr. Tonge from ova laid in captivity which I sent to him. Those of *parthenie* are very noticeably larger than those of *aurelia*; the latter are laid more apart from each other, and consequently retain the regularity of their shape much more fully than the former. Both are somewhat lemon-shaped, the micropylar end being smaller than the base, and have a very slight sculpturing of longitudinal lines. Mr. Tonge also photographed some eggs, obtained by dissection from Reazzino *britomartis*, but they were so dried up that very little can be made out from them. They are of course of the same general shape, and in size seem to come between the other two; there appears also to be a greater difference in size between the micropylar and basal ends.

With regard to the larvæ, I should have liked to use Buckler's description of the larva of *athalia* as a standard of comparison, but as the expressions used for the positions of the spines do not all seem quite suitable, and as moreover the segments are not named in accordance with the usual practice, and one or two other points appear not quite satisfactory, I have modified this description somewhat, and shall call attention to any differences other than those of nomenclature. He says that the full-grown larva is about an inch in length and moderately stout. The head is indented on the crown, widest at the sides near the mouth, and rather flattened in front; the body is thickly covered with obtuse conical spines to the number of one hundred and thirteen, arranged as follows: there are eleven rows of spines on the first seven abdominal segments, one dorsal, two subdorsal, two supraspiracular, two sub-spiracular, and four (or two double) ventral. The prothorax, he says, bears only two spines on each side—the two lowest—but this is not, strictly speaking, the case; only the dorsal is really absent, the remaining six being placed close together in the middle of the segment, but all quite distinctly visible with a lens (these six of course are not included in the total of one hundred and thirteen); the dorsal spine is absent on the meso- and metathorax, and on the latter the upper ventral pair are also represented. The eighth abdominal he describes as bearing ten spines, the lateral (*i. e.* upper ventral) pair being absent and the dorsal being doubled, one being placed in front of the other; whilst on the ninth abdominal, he says, there are four spines, two on each side, in a line with the supra-spiracular row. It would, I believe, be more exact to say that the eighth abdominal bears nine spines, the *lower* ventral pair being absent and the dorsal being placed far forward on the segment—that the ninth bears three, *viz.* the supra-spiracular pair and the dorsal, the latter again being on the very front of the segment, and the tenth abdominal bearing the supra-spiracular pair only. With these modifications the description so far would apply equally well to the larvæ of *parthenie* and *aurelia*, except that the central rows of spines are much less developed in the former on the prothorax, better developed in the latter; in *parthenie* also the upper ventral pair are very slightly represented, and the lower ventral absent on the metathorax. I find also in my notes made from the living larvæ that in *parthenie* the supra-spiracular and in *aurelia* the sub-spiracular pair are present on the ninth abdominal, but as there is no spiracle on this segment this merely means that the pair present are placed somewhat higher in the former than in the latter. "Of all these spines," says Buckler of *athalia*, and it would be equally true of *parthenie* and *aurelia*, "those in the two lowest rows are the most slender and the smallest, and those in the subdorsal rows are rather the largest." With regard to colour, he continues:—"The ground colour of the back is black, becoming gradually blackish olive on the sides, the belly olive-brown, the anal flap and also the segmental divisions olive; all the skin is thickly covered with whitish spots that are very slightly raised, giving it a tessellated appearance, except that a dorsal stripe of the black ground is left." This latter is not conspicuous. "There is a lateral series of three large irregular spots on each segment below the spiracles, which almost forms a broadish longitudinal stripe." These spots are not raised like the small ones, and would, I think, have been better described as a rather broad, irregular, whitish stripe below the spiracles. "The head is black, with a transverse whitish stripe just above the mouth, and a group of whitish spots on the crown of each lobe, which, as does the rest of the head, emit fine black bristly hairs; on the front of the prothorax is a narrow, raised, semi-circular plate of greyish flesh-colour, also emitting black bristly hairs; the colour of the spines of the dorsal and subdorsal rows is orange-ochreous, growing whitish at the tip, and of the dorsal row also rather pale at the base; those of the supra-spiracular row are of a paler ochreous tint, with more of their tips whitish; all the spines are thickly set with straight, short, pointed black bristles at an acute angle, and, for the most part, each white spot on the body emits a fine, short black hair; the spiracles are black, ringed with whitish; the anterior legs black, the ventral prolegs of a pellucid drab colour, tipped with darker drab hooks."

The following notes on larvæ I took from living specimens in my own possession:—

Aurelia.—Larvæ found at Sion, April 25th, in the middle of plantain-leaves, only one being found beneath. General appearance grey with white spines, apparently set on yellow-brown lines; rather closely resembling fallen alder-catkins. Seen through lens, the ground colour is shown to be black, thickly studded with white dots in transverse lines. There are eleven transverse rows of short spines or papillæ, the five central yellowish brown at the base, all being very white at the tips, the two lowest on each side white throughout. The five central rows have many black setæ pointing upwards, the sub-spiracular (which is placed on a white line) has the black setæ spreading out laterally. The double ventral row is much smaller, with few hairs. The arrangement of the spines is, except as described above, the same as in Buckler's description of the larva of *athalia*. Spiracles black surrounded by white. Head shiny, black with white dots. True legs black and shiny. Prolegs white, with slight greenish tinge. Head and prothorax retractile.

First went up April 27th; found as pupa (fallen) April 30th.

Parthenie.—Larvæ found at Charpigny, April 29th, on plantain-leaves, not disposed like *aurelia* to eat out the middle of the plant, but more frequently found on the edges or under the leaves. General appearance darker, brighter, and rather larger, also with browner spines than the *aurelia* larvæ from Sion. Spines arranged as in *athalia*, with the exceptions mentioned above. The white lateral line is less visible than in *aurelia*, and is succeeded beneath by a purplish-chocolate band, more or less broken, which is much less visible in *aurelia*. The larva is not unlike the last year's seeds of the plantain.

First went up April 29th, one on May 1st, two more on the 2nd, &c.

Dictynna.—Larva found at Caux, June 3rd. General appearance grey, with yellow-brown spines. Through lens, black ground with *much* white in spots and streaks. Spines yellow-brown to tip, which is just touched with white. Prolegs light semi-transparent greenish, hooks black. Legs black. Head black, with only a few white spots on the top, and a white streak above the mouth. Spines, as usual, in eleven rows. Only double ventral and slight indication of central* rows on prothorax; dorsal and sub-spiracular rows absent on meso- and metathorax, and the upper ventral truncated, especially on the latter. The long pair on the tenth abdominal appear to be the upper ventral. Otherwise as in *athalia*. The ventral pairs, especially the lower, much whiter than the other spines.

Full-fed larva of var. *berisalensis*, received from Wullschlegel,

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* This does not include, I think, anything to represent the dorsal row.

May 17th. General appearance darker than *parthenie*; spines more orange. Through lens, the double row of ventral spines larger and more closely covered with setæ than *aurelia* or *parthenie*. No white line at the sides. Abdominal prolegs whitish with black hooks. White spots on body fewer and smaller than in the other species. Dorsal row of spines very noticeably smaller than the *two* rows on each side of it. Spiracles large and black, narrowly ringed with leaden grey. Not much white on head. Prothorax, double ventral spine and setæ of central rows present. On meso- and metathorax the double ventral row has the lower spine rudimentary and placed before the other. Dorsal spine absent. The former has a fairly well-developed, the latter a rudimentary, sub-spiracular. Spines whitish orange, and placed on rather brighter orange patches, the tips of the spines only being whitish; the two ventral rows are, however, white throughout. Sur-anal flap semi-transparent dark grey; anal prolegs the same colour, with whitish band above black hooks.

First larva pupated May 17th.

(To be continued.)

SOME AFRICAN BEES OF THE GENUS *ANTHOPHORA.*

By T. D. A. Cockerell.

The Ethiopian region is very rich in the swift-flying bees with banded abdomen, belonging to the group of *Anthophora* which Friese has named *Amegilla*. The typical member of this series, *A. quadrifasciata*, Villers, is very widely distributed, from Germany to South Africa. There are, however, very numerous closely allied forms of local distribution, which probably are adapted to different genera of tropical plants. In the north *A. quadrifasciata* and the related *A. albigena* are especially found at flowers of *Anchusa*, while another member of the group, *A. salviæ*, is said to regularly visit *Salvia*. Some day, no doubt, observations of this sort will be made on the many tropical species, but at present all that students of bees can do is to describe the insects as they occur in museums, leaving the more interesting work of elucidating their natural history to others and to the future. The material on which this paper is based is in the British Museum.

Anthophora medicorum, n. sp.

♀. Length about 11 mm., expanse 20; mandibles (except apex), labrum (except a dusky spot in each upper corner) and clypeus (except a large quadrate black area on each side above) pale ochery yellow; a very broadly triangular supraclypeal mark of same colour; scape ferruginous, mainly pale yellowish in front; flagellum ferruginous above and below; third antennal joint about or almost as long as the next three together, fourth very short; hair of head and thorax above very pale fulvous, with black intermixed; abdominal bands broad and very distinct, dull greyish white with a creamy tint; apex of fifth segment broadly tufted with dark fuscous hair; tegulæ clear rufofulvous; wings slightly dusky, stigma obsolete, nervures dark rufofuscous; hair of front legs white; of middle pair black on under side of femora and tibiæ, white on outer side of tibiæ, brown-black on tarsi, except the basal two-thirds of basitarsus on outer side, where it is white; hind legs with hair black, white on knees, posterior side of tibiæ (except a ferruginous stain below knee-plate), and tuft on base of basitarsus. Runs in Friese's table of Palæarctic species to *A. albigena*, to which it is closely allied, differing by the redder tint of the thoracic hair; the very much greater amount of yellow on clypeus; the lower edge of clypeus narrowly brown, but not black; the interval between clypeus and eyes yellow throughout; and the red antennæ. The colour and arrangement of the hair on the hind legs is about the same in both. From *A. quadrifasciata* it is easily known by having the area between clypeus and eyes yellow, the antennæ red, &c. From *A. circulata* (Fabr.), which it much resembles, it differs by the narrower face, the light ochre-yellow eyes, and the much shorter third antennal joint. From *A. calens*, Lep., it differs by the broader and much whiter abdominal bands, &c.

Hab. Bohotle, Somaliland, 1903 (Vety.-Major A. F. Appleton). This has the aspect of a desert insect.

Anthophora zombana, n. sp.

♀. Length about 12 mm., expanse 19; base of mandibles, labrum, and clypeus a sort of pinkish white, the clypeus with a pair of small brownish spots above, but otherwise unmarked; mandibles dark red in middle, and beyond that most of the outer side straw-yellow; supraclypeal mark a narrow band; no lateral face-marks; antennæ dark, flagellum very obscurely reddish beneath, especially at apex; hair of head and thorax above, including face above clypeus, brilliant orange fulvous, mixed with black on thorax; beneath the hair is white as usual; tegulæ clear rufotestaceous; wings dusky, nervures piceous; hair of femora pale, but that of middle and hind tibiæ and tarsi black, except a very narrow line of white along hind edge of hind tibiæ; abdominal bands distinct but dullish, the first two or three orange fulvous, the fourth, and third at sides, purplish white; sides of fifth segment with white hair. This would be taken at first sight for *A. quadrifasciata*, but it is easily known by the light clypeus and the black hair of hind tibiæ and tarsi. The closest affinity seems to be with *A. nigritarsis*, Friese, but it is larger than that, and has the colour of the legs differently distributed. The labrum is coarsely rugose, and the third antennal joint is about as long as the following three together. The eyes are grey-purple.

Hab. Zomba, British Central Africa, April, 1906 (J. E. S. Old).

Anthophora leucophora, n. sp.

♂. Length about 15 mm., expanse about 24; hair of head and thorax coloured as in *A. zombana*; hair-band on first abdominal segment narrow and fulvous; segments two to four with very well-marked white hair-bands (not so broad as in *A. medicorum*), strongly contrasting with the black background; wings dilute fuliginous, about as in *A. basalis*, Sm.; anterior femora and tibiæ with much fulvous hair behind, and their tarsi on outer side covered with the same hair, otherwise the hair of the legs is black (a little pale along hind margin of middle tibiæ), including all of posterior tibiæ and tarsi. Basal half of mandibles, labrum, lateral face-marks (filling space between clypeus and eyes), clypeus (except two very large black areas, leaving a dagger-shaped central light band), and a very low supraclypeal triangle, all brownish or pinkish white, the lower margin of clypeus narrowly ferruginous; scape rather stout, with a large white mark in front; flagellum black, very faintly reddish beneath; third antennal joint about as long as the next three together, the fourth very short; mesothorax densely punctured; tegulæ ferruginous; apex of abdomen broadly shallowly emarginate.

Var. *a*. Clypeal marks reduced, emarginate below; posterior tibiæ with a patch of fulvous hair on middle of outer side, and a small white apical tuft.

Hab. Zomba, British Central Africa, April, 1906 (J. E. S. Old). This cannot be the male of *A. zombana*, for not only is it much larger, with differently coloured abdominal bands, but there is a difference in the venation. The third submarginal cell is very broad below, and conspicuously narrower above, whereas in *A. zombana* it is broader above than below. Superficially, *A. leucophora* looks exactly like *A. quadrifasciata* from Oran, but the dark clypeal marks, much more slender third antennal joint, and colour of hair on hind tibiæ readily distinguish it.

COMPARATIVE NOTES ON *V. URTICÆ*, L., VAR. *ICHNUSA*, BON., AND VAR. *TURCICA*, STAND. IS *V. URTICÆ*, L., THE "REDDEST" FORM AMONG ALL THE "TORTOISESHELL" VANESSIDÆ?

By T. Reuss.

(Concluded from p. 281.)

The var. *turcica** is, on the other hand, often most faithfully pictured in a single aberrative specimen of *urticæ*, the form often emerging under normal external conditions; and if only the upper side is considered, this aberration is perhaps a little more frequent in England than in Central Europe, but the under side of British specimens is often too black.* The extreme form of var. *turcica*, with almost obsolete inner marginal spot and puncta, also appears in aberrations of *V. urticæ*, but only under the influence of high temperature or of strong contrasts of temperature, and *not every* brood of *V. urticæ* larvæ will produce it, the influence of temperature often not being sufficient to overcome possible hereditary tendencies in another direction.

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* Considered as a *local* race, variable in itself.

The "tawny" appearance of var. *turcica* is produced by the darkening of the yellow spots with orange; in addition, this form has a brownish tinge in the ground colour, which, however, also appears often in the ground colour of specimens of northern *V. urticæ*. This browning of the ground colour must not be confounded with the yellowish colouring often produced by less favourable temperature conditions abnormally retarding the larval and pupal period, or with the dulling of the ground colour caused by extreme conditions; compare var. *polaris*, Stdgr., always assuming that under this name specimens from Northern Europe are understood, *which among themselves may vary considerably*,† and specimens of var. *turcica* from Syria may also be compared, as often showing the effects of extreme conditions of another kind.

In this connection it is also necessary to remember that an upper side facies like that of *turcica*, with the yellow parts almost obsolete and changed to the ground colour, appears as an atavism, as is shown by the developing wing in every pupa of *urticæ*, in which the yellow spots are at first *not differentiated* from the ground colour.

Fiery specimens of *urticæ*, such as ab. *ignea*, Rynr., are very different from the southern varieties; but I do not wish to imply that *ichnusa* and *turcica* might not also develop *red* aberrations under suitable conditions. I would note, however, that *V. urticæ* from Persia seems also to be distinguishable by a warmer coloured yellow-brown under side and a very clear orange-golden upper side with somewhat reduced black and yellow markings (var. *persica*), so that, generally, these southern forms appear *less red*—but more brilliant from a greater unbroken expanse of colour—than their northern kindred. The *actual colour* seems to be least different from *V. urticæ* of Central Europe in var. *ichnusa*; but *to the eye* the difference is greatest just in this variety, which, by the character of its facial detail, again invites two questions which have arisen before: Is *ichnusa* an insular "relic"? May it claim specific rank?

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* Also specimens from the western parts of continental Europe seem to exhibit the *black* under side facies oftener than specimens from more eastern parts. In Tuscany the brown form is already the most common, if I may trust my experience.

† To me the var. *connexa* of Japan has little to do with the var. *polaris*.

Aberration in *urticæ*, type, shows that *ichnusa* is much more than merely a climatical variety—like, for instance, *turcica*, *persica*, *polaris*—and forms of *urticæ* with small or obsolete puncta or inner marginal spot can scarcely be considered to be *ichnusa* if the spots are not also *displaced*, as in *ichnusa* also the ground colour of *urticæ must not be changed* in such forms, for it is already *ichnusa*-form in all *normal* bright specimens; instead, a *spread* of the ground colour would be wanted, and in addition a spread also of the basal suffusion. And this, as has already been shown, is not all. Still other alterations of the facies would be needed before it could be said that an aberration of *urticæ* deserved—by its facies—the name of the Corsican form *ichnusa*. Thus the description of *ichnusa quoted* by Mr. Raynor in the Ent. Rec. pt. 1, 1909, "Variation of *V. urticæ*," was quite insufficient to characterize this form, and *if* he based the statement upon it that *ichnusa* had appeared in England (made on page 7), then perhaps it would be found that the specimens Mr. Raynor referred to were only *in some ways ichnusa*-form, but were perhaps more like *turcica*, for reasons already dealt with.

No doubt the var. *turcica* is *ichnusa*-form, at least in the spread of the ground colour. This "all-orange" facies appears occasionally by aberration in *urticæ under almost all kinds of external conditions* of development; most easily, however, does it show itself after development (both larval and pupal) has taken place in a low, contrastless temperature. This colouring is no doubt atavic, as already noted. And also, from other facial details, it seems that *ichnusa* and *turcica* represent old forms, while *urticæ* is comparatively progressive, so that its only excuse for posing as the "type" rests with the fact that it is the most common and widely distributed modern form among its kindred. The resemblance noticeable in *ichnusa*, female, to the atavic *V. io* ab. *fischeri** gives evidence of atavic features retained in the facies by *ichnusa*. It may also be not without interest to note that, whereas shadowy median puncta appear in *male ichnusa*, but are absent in the female, the reverse is the case in the American *milberti*. This species, which is usually without puncta, shows traces of them first in the *female* specimens, and in these they appear in the same relative position as in *urticæ*. When comparing the *position* of the puncta in other "tortoiseshell" Vanessidæ, one finds that the variable *levana* shows these markings in almost every possible form of variation, as they are found in other Araschnids and in some Pyrameids, but also as in *ichnusa* and as in *urticæ*; and usually the *ichnusa*-form puncta are found in the female.

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* In *antea*, vol. xlii. pt. 12, p. 311, I figured *V. io* ab. *fischeri* together with two forms of *V. io* common in the field. In the accompanying text I had suggested that each of the latter forms was mainly dependent on certain conditions of temperature. Having satisfied myself of the truth of this by suitably conducted experiments on ova, larva, and pupa, I will now name the spotted form, fig. 2, ab. *mesoides*, and the banded form, fig. 3, ab. *teloides*.

The *Grapta*-species also in their *female* forms show the puncta mostly in the same position as in *ichnusa*. These species, with their "four puncta," are of special interest, one puncta coinciding with the "nota" of *ichnusa-urticæ*, the fourth near the costa reminding of the projection to the second costal blotch of *V. io*, which helps to round off the ocellus in that species. I have found this fourth spot to occur separately in *urticæ*-aberrations. *Polygonia*-species show the puncta too near the margin to be quite *ichnusa*-form, but the puncta are placed in the same slanting position as in *ichnusa*, those in the many forms of *c-album* approaching nearest to the corresponding markings in *Grapta*-species. The puncta of *Eugonia polychloros*, of *xanthomelas*, and of *L. album* are quite *urticæ*-form; only the puncta in *californica*, together with the small inner marginal spot, remind of the markings in *ichnusa*. The interesting yellowish and black basal suffusion in *ichnusa* can be found developed to a similar degree in *L. album*, and is also fairly well marked in *californica*; it is less conspicuous in normal *polychloros*, and still less apparent in *xanthomelas*, in which species it resembles more a darkening of the ground colour, and this is also the case in the *Grapta*-species. The forms of *Polygonia* usually exhibit a very clear basal area, but *c-album* is an exception, and occasionally shows the black and yellowish basal suffusion very strongly. In *A. levana* the basal upper side parts show up the under side markings—a yellowish ring, which is black in the under side of *V. urticæ*; the general yellowish basal suffusion is almost wanting, thus leaving the base black. This *black* basal colouring, which is very variable in extent, turns up also in aberrations of *V. urticæ* (ab. *basi-nigra*). As regards the *marginal* developments in the "tortoiseshell" Vanessids, most of these also are suggested by the facies of *A. levana* and its many forms.

Thus the outer margin will be found to be dark, unmarked (as in *V. io, ichnusa* female, *xanthomelas*), but with a white border fringe in *levana*; or usually the margin will be of the ground colour, marked by a dark line, as in most forms; or occasionally almost wholly of the ground colour. The "lunules" either appear as separate black spots or form a continuous black (or brown) band—for instance, in species of *Grapta* (brown markings), *Polygonia* (brown, brown-black), *Eugonia*; or they are marked by straight or irregular blue lines (only in the hind wings as in other Araschnids, in *normal E. polychloros, xanthomelas*); or they appear as well-defined blue lunules in both wings (or only in the hind wings), as in *urticæ* and many of its local forms. By aberration, specimens of *xanthomelas* from Asia (Amur, Tianschan) occur with yellowish grey outer margins (ab. *griseomarginata*, parallel to *V. urticæ* ab. *griseomarginata*), which look strikingly *antiopa*-form.*

No marginal markings in a "normal" tortoiseshell Vanessid approach nearer to those in *V. io* ab. *fischeri* than the markings in female *ichnusa*.

Comparing, now, the *ground colour* of all the tortoiseshell Vanessids, it becomes apparent that various shades of more or less brilliant yellow-brown, sometimes orange or golden in tint, are common to them all, including *V. urticæ* and its related varieties; *but that V. urticæ differs from all the other forms by its marked tendency to develop a reddish and even a red ground colour* at slight inducement. Even the finest, most brilliant examples of *xanthomelas* from Japan (large) or from Switzerland (smaller), which I have, are rich *yellow*-brown, not *red*-brown in colour, and the same is the case with *E. polychloros* var. *erythromelas* (Algiers). Comparison with reddish specimens of *V. urticæ* (for which I suggest the name var. *igneaformis*, as the extreme ab. *ignea*, Rynr., is either extremely rare or unknown even in the field) quickly dispels any possible doubt. I do not wish to imply, however, that *red* forms are *quite* impossible in the other species as exceptional aberrations, though I have so far not been able to find any tendency to red in their ground colour. And it is not without interest, perhaps, to note that the "brown" *xanthomelas* seems facially related to the "brown" *antiopa*, much as the "red" *urticæ* is related to the "red" *V. io*.

A NOTE ON THE OVUM AND YOUNG LARVA OF *SCOPARIA MURANA*.

By Alfred Sich, F.E.S.

In July, 1909, Mr. South kindly handed me some ova of *Scoparia murana*, laid by a moth he had taken at Bishop Auckland on the 15th of that month. They were laid in groups of three to five and some singly, not very firmly attached. From the manner in which some of the eggs were laid round a puncture in the lid of the box, I should imagine that in nature

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* The peculiar facies of *Euvanessa antiopa*, like that of *V. io*, is developed from the "tortoiseshell" facies, as was shown by Prof. Standfuss in his 'Handbook of Palæarctic Macro-Lepidoptera,' with the help of an excellent atavic aberration of *antiopa* (figured pl. vii. fig. 3), showing traces of the median puncta on the fore wings, and of the orange-brown ground colour; also the specimen exhibited a *narrow grey margin*. The ground colour of *antiopa* may be called a deep rich brown tinged with *violet*, that of *io* a rich orange-brown tinged with *red*. In Japan, *V. io* var. *geisha*, female, occurs with a *brown* ground colour, *tinged orange*—probably an atavism—and in America *antiopa* often exhibits a purely brown colour and a darkened margin, which also, perhaps, are atavic features.

they would be thrust down into the moss. When first laid they were, as Mr. South informed me, pale straw colour. When I examined them about ten days later, the black head and red body of the larva were visible through the shell. In shape ovoid, rounded at both ends; length about 0·5 mm., and greatest width 0·37 mm. They varied somewhat in size. The whole surface was very minutely pitted and broken up into irregular pentagonal cells. The newly hatched larva measured 1·5 mm. and the width of the head was 0·25 mm. The body tapers gradually to the anal extremity and is slightly flattened. The segmental and subsegmental divisions are very well marked. The head is dark olive-brown, the prothoracic shield brown with a pink tinge, meso- and metathorax greenish-grey. The abdominal segments are red with a scarlet tinge, except the ninth and tenth, which are again greenish-grey. The legs are large, and the prolegs rather long and slender. The spiracles are large, circular, and dark ringed. The meso- and metathorax have each three subsegments, the tubercles being on the second subsegment. In the abdominal segments, tubercles one and three are on the first subsegment, while two is on the second subsegment. Tubercle four is below and slightly behind the spiracle; five, quite separate, below and in front of four. Tubercle six not seen, probably absent; seventh represented by a pair of tubercles. The tubercles are grey, and, I believe, bear a single simple rather long seta, but of this I have no note. There are a few rows of spicules on each subsegment.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 313.)

Notodonta (?) *basinotata*, sp. n.

Fore wings brownish, greyish on costal area, a black patch on basal fourth; a whitish patch at end of cell, enclosing a black dot; antemedial line black, twice angled towards the inner margin diffuse towards the costa; postmedial line black, crenulate, terminating on inner margin near the antemedial; veins marked with black, blackish streaks between them on the outer area; fringes brownish, chequered with black. Hind wings pale fuscous, brownish hairs on the inner margin, veins darker, a black cell spot. Under side whitish buff, suffused with blackish on costal two-thirds of fore wings, powdered with blackish on costa of hind wings; all the wings have a blackish cell mark, and an incomplete postmedial line.

Expanse, 56 millim.

Collection number, 1197.

One male specimen from Kanshirei (1000 ft.), April 27th, 1908.

Pydna albifusa, sp. n.

♂. Head and thorax pale brown, whitish mixed; abdomen whitish, anal tuft pale brownish. Fore wings ochreous brown, suffused with whitish on the basal area; veins and a streak from middle of the base to the apex rather darker, the latter tapered at each end; some darker transverse lines on the outer margin. Hind wings and the under side of all wings whitish.

♀. Rather larger and without anal tuft.

Expanse, ♂ 43 millim., ♀ 48 millim.

Collection number, 1230.

One example of each sex from Kanshirei (1000 ft.); the male taken April 30th, 1908, and the female in August, 1907.

Near *Pydna obliqua*, Hampson.

Tyana acypera literata.

Fore wings green, costa and fringes yellowish white; apex flecked with purplish brown; a purplish brown S-like mark about middle of the wing. Hind wings and the under side of all wings white.

Expanse, 34 millim.

Collection number, 731 *a*.

A female specimen from Daitözan (8500 ft.), September 20th, 1906.

Panthea grisea, sp. n.

Head and thorax grey; abdomen blackish, posterior edges of segments greyish. Fore wings grey, orbicular stigma represented by a black point, reniform outlined in black, with a black spot at lower end; subbasal and antemedial lines black, the former not extended to the inner margin, the latter angled above the inner margin, bent towards the costa, and inwardly edged with white; medial line black, irregular; postmedial line black, crenulate, bent inwards below middle, angled on inner margin, outwardly edged with white; submarginal line white, sinuous, partly shaded inwardly with black; fringes chequered. Hind wings smoky grey; a dusky discoidal spot, and two dusky bands enclosing a paler one beyond. Under side of the fore wings blackish inclining to greyish on the margins, postmedial line darker, followed by a whitish band; hind wings whitish grey with blackish discoidal mark, and three transverse bands.

Expanse, 42 millim.

Collection number, 1794.

One male specimen from Rantaizan (7500 ft.), May 11th, 1909.

Anonychia sinuosa, sp. n.

♂. Fore wings blackish brown, striated with ochreous on costal area, and sprinkled with paler on basal area; antemedial line whitish, sinuous, not distinct, edged with black at each extremity; postmedial line whitish, slightly angled near costa, thence sinuous to inner margin; a dusky central shade enclosing a black discoidal mark. Hind wings fuscous, discoidal spot blackish, traces of a dark edged white postmedial line. Fringes dark brown marked with pale brown.

♀. Agrees with the male, except that the postmedial line of hind wings is traceable to the costa.

Expanse, ♂ 34 millim., ♀ 39 mm.

Collection number, 837.

An example of each sex from Arizan (7300 ft.), September, 1906.

There are three specimens from Tokio, Japan, in the British Museum Collection.

Ab. *brunnea*, nov.

The general colour of all the wings is browner, and the middle sinus of the postmedial line is rather deeper.

A male specimen and also a female taken at Arizan with the type.

Heterolocha arizana, sp. n.

Fore wings yellow; antemedial line pinkish, wavy; postmedial line pinkish, incurved at middle, very slender, and dotted with black from costa to vein four, followed by a pinkish cloud towards the inner margin; discoidal mark ringed with pinkish. Hind wings yellow; a diffuse pinkish cloud on outer marginal area towards dorsum. Under side yellow, heavily freckled with pale violet-brown; inner margin of fore wings whitish; postmedial band violet-brown, interrupted by the veins.

Expanse, 31 millim.

Collection number, 864 *a*.

A male specimen from Arizan (7300 ft.), August 8th, 1908.

Near *H. rubrifera*, Hampson, and may be only a local form of that species.

Heterolocha marginata, sp. n.

Differs from *H. arizana* in having the yellow ground colour faintly green tinged; the area beyond postmedial line is purplish; fringes yellow. Under side purplish, costal area of the fore wings yellowish; fringes yellow.

Expanse, 34 millim.

Collection number, 865 *a*.

A male specimen from Arizan (7300 ft.), August 18th, 1908.

Quite possibly this also may prove to be a form of *H. rubrifera*.

Heterolocha taiwana, sp. n.

♂. Fore wings pale brown, violet tinged; ante- and postmedial lines purplish brown, bent towards each other below the middle, enclosed space rather darker brown, slightly yellow tinged in some lights; discoidal mark faintly darker, indistinct. Hind wings paler and more violet tinged; discoidal dot dusky, faint; postmedial line brownish, faint towards the costa. Fringes and under side brown, reddish tinged.

Expanse, 33 millim.

Collection number, 865.

A male specimen from Arizan (7300 ft.), September 23rd, 1906.

Near *H. niphonica*, Butler.

Nadagara umbrifera, sp. n.

♂. Fore wings greyish brown, clouded with darker brown, costa ochreous, strigulated with brown; antemedial line brown, diffuse and indistinct, excurved in the cell; postmedial line brown, nearly straight; a brown slightly curved line from costa, near apex, to below vein six, a few whitish scales on its outer edge, space between it and postmedial line brownish; a brownish cloud from postmedial line to tornus; fringes pale brown marked with darker. Hind wings greyish brown, a central ochreous cloud, outer area suffused with ochreous, basal area dusky; a brownish medial line, slightly sinuous; fringes brown, tips paler. Under side greyish, violet tinged; costa of fore wings and veins of all the wings ochreous.

Expanse, 34 millim.

Collection number, 873.

A male specimen from Kanshirei (1000 ft.), April 30th, 1908.

Hyposidra virgata, sp. n.

Pale cinnamon-brown, clouded and suffused with darker. Fore wings violet-brown at base and along costal area almost to a similar coloured dash over the postmedial line; a violet-brown apical patch; antemedial line dark brown, edging the basal patch; postmedial line dark brown, nearly straight, slightly angled near costa; submarginal series of whitish marks, partly edged with blackish, the two nearest inner margin black and punctiform. Hind wings have indications of a dusky antemedial line, and a well-defined dark brown postmedial line; traces of a submarginal series of pale-edged dusky marks.

Expanse, 36 millim.

Collection number, 855.

A male specimen from Kanshirei (1000 ft.), June 18th, 1906.

Ab. *pallida*, nov.

Pale whity brown sprinkled with brownish; the markings, except basal patch of fore wings and postmedial line of all wings, less clearly defined.

Expanse, 33 millim.

Collection number, 854.

A male specimen from Kanshirei, September 26th, 1906.

Leptodontopera (?) *taiwana*, sp. n.

Fore wings pale brown on basal two-thirds and along costa to apex, tinged with ochreous below the cell; antemedial line dark brown, slender and flexuous to lower end of cell, where it is sharply angled, thence oblique, inwardly shaded with brown, to inner margin near base; postmedial line dark brown, angled below costa, gently curved towards the inner margin, closely followed by a diffuse blackish line, which curves from the angle of the line to the apex of the wing; the outer marginal area, limited by the postmedial line and the apical continuation, is suffused with dusky; a black dot at end of cell; two black marks beyond the postmedial line, one above the middle, the other towards the inner margin, both outwardly flecked with whitish. Hind wings brown, paler towards the base, and darker towards the outer margin; a black dot at end of cell; a dark brown, curved, slender submarginal line, followed by a whitish line, which does not extend to the costa.

Expanse, 34 millim.

Collection number, 874.

An example of each sex from Kanshirei (1000 ft.). The male taken in May, and the female in August, 1908.

In colour and markings very close to *L. codra*, Swinhoe, but the fore wings are not scalloped, and the hind wings are less crenulate on outer margin.

Gonodontis variegata, sp. n.

Fore wings pale brown, faintly mottled with ochreous, and sprinkled with blackish scales except on outer margin; ante- and postmedial lines blackish, flecked and spotted with whitish, the largest spot at the costal end of each line; space between lines reddish brown, enclosing ochreous clouds; postmedial line followed by a brownish shade, most distinct on the costa, less distinct between veins four and six; discoidal spot blackish, oval, flecked with whitish. Hind wings pale brown much flecked with darker; an almost round discoidal spot, and straight postmedial line, both blackish, the latter partially edged outwardly with whitish. Under side pale brown, clouded and freckled with blackish, chiefly on basal three-fourths; a black discoidal spot, and postmedial line on all the wings.

Expanse, 42 millim.

Collection number, 856.

A male specimen from Arizan (7300 ft.), September 16th, 1906.

Garæus luteus, sp. n.

♀. Orange-yellow, clouded with darker orange. Fore wings have a black discoidal dot, and two purplish transverse lines; first line wavy, slightly curved; second line elbowed below the costa, thence parallel with outer margin; a wavy orange-brown line traverses the outer marginal area, commencing in a small patch of the same colour at the apex. Hind wings have a black discoidal dot, and a straight purplish postmedial line. Fringes brownish, tips variegated with whitish.

Expanse, 36 millim.

Collection number, 858.

A female from Daitozan (8500 ft.), September 25th, 1906.

Arichanna picaria, sp. n.

♂. Head, thorax, and abdomen yellow, spotted with black; anal tuft yellowish, mixed with black at base. Fore wings white, with four bands composed of more or less confluent black spots; the medial band is most complete, the third band is short, and there are scattered black dots between the bands. Hind wings white with a few black dots and spots on the disc, traces of black bands on the inner marginal area, and an interrupted black border on the outer margin.

♀. Similar to the male, but the medial band of fore wings encloses three spots of the ground colour—one on the costa, one about middle, and one on the inner margin.

Expanse, ♂ 63 millim., ♀ 69 millim.

Collection number, 1667.

A male from Rantaizan (7500 ft.), May 8th, 1909; and a female from Toroyen, Arizan district, (4000 ft.), June, 1908.

Note.—Page 290, line 3, delete "*variegata*, sp. n."

(To be continued.)

NOTES AND OBSERVATIONS.

Darwin Medal of the Royal Society.—Our readers will be interested to know that this year the "Darwin Medal" of the Royal Society is presented to Mr. Roland Trimen, M.A., F.R.S., F.E.S., in recognition of the services rendered by him to entomological science, especially in connection with the work of the author of the 'Origin of Species.' As Mr. Trimen's labours have been concentrated almost wholly upon Lepidoptera, the honour bestowed upon him will be generally appreciated by Lepidopterists throughout the United Kingdom. It may be observed, also, that the Entomological Society of London, at their meeting on November 16th, unanimously approved the despatch of a letter of congratulation to the recipient of what is regarded as one of the highest distinctions in the gift of the Royal Society.—H. R.-B.

Entomological Society of London.—Mr. H. Rowland-Brown asks us to state that he will not seek re-election as one of the Honorary Secretaries of the Entomological Society of London at the Annual General Meeting to be held on January 18th, 1911. His successor-designate is the Rev. George Wheeler, M.A., known to many of us as the author of that very useful handbook 'The Butterflies of Switzerland and the Alps of Central Europe,' and a valued contributor to the pages of the 'Entomologist' as a high authority on the western palæarctic Melitæids.

Further Notes Regarding the Breeding of Chilosia grossa.—In my note on the breeding of this dipteron, in the 'Entomologist' for November, line 3, p. 314, should read: "They pupate in the hollow *stem*." But from my experience of this year it appears that this is not invariably, or perhaps even generally, the case. I found in August last a patch of *Cnicus palustris*, in which were larvæ of *Chilosia grossa* in some numbers. I took only about half-a-dozen, intending to take the pupæ later on in the hope of breeding more specimens of the ichneumon for Mr. Morley. To-day, November 5th, I visited the place, but only succeeded in finding one pupa, though the working of the larvæ was apparent in many of the thistle stems. Most of the stems which had contained larvæ were eaten through near the base, and the larvæ had disappeared, probably having pupated in the ground. I also find that the working of the larva is usually confined to the lowest portion of the thistle stems, though they are sometimes found in the upper portion. Mr. Morley's remarks on my note on p. 314 of the 'Entomologist' for November should read "The re-discovery of *Phygadeuon ambiguus*," &c., as, of course, *Chilosia* is a well-known insect.—C. G. Nurse (Lt.-Colonel); Timworth Hall, Bury St. Edmunds.

Carpocapsa nimbana, H. S.—The two dark moths Mr. Whittle bred from beech-mast are no doubt this moth, so much wanted in nearly all collections. I first bred it, a single specimen, in May, 1889, and since those days have bred a fair quantity but always in small numbers; one lucky season I bred fifteen, but never so many before or since. I have never seen the feeding larva, but no doubt it feeds in beech-mast. I only on one occasion met with the imago, four specimens, at rest on the beech-trunks, after a heavy gale the previous night. Although I have spent very many hours in searching the trunks of beech-trees at all hours of the day from 6 a.m. till dusk, I never found any other specimens. To breed the moth I prise off any little pieces of loose bark I can find on the trunks of the large trees during the month of April, and once in a while a little cocoon will be found, sometimes containing a larva, or later in the month a pupa, but *very* much more frequently it will be an empty one! Searching for these cocoons where there is no lichen or moss to peel off, as is alas! generally the case in the London district, is one of the most dreary, monotonous occupations imaginable, and often a very disappointing one. Always use silver pins, as the moth, unlike its near relative, *C. juliana*, is very subject to grease and verdigris. The imago comes out early in May.—A. Thurnall.

Eupœcilia udana, Gn.—I was much surprised to read in the October number of the 'Entomologist' (p. 295) that so experienced a collector as Mr. Whittle had not met with this species until July last. I found the larva the first time I looked for it! This was on Hackney marshes as far back as 1885. Since then I have hardly ever failed to find larvæ wherever the food-plant (*Alisma plantago*) grows freely. The perfect insect is not so often seen. The best way to obtain the species is to search by splitting open a few of the dead stems, and the larvæ, if present, will be found throughout the winter months spun up in little cocoons attached to the side of the stem; they are easily overlooked, but if the pith shows signs of having been gnawn and frass is scattered about, one may be sure that the larva is somewhere in the stem, usually in the upper half. Now gather a good bundle, trimming off the branches, and stick the main stems in the garden; towards the end of May bring them into the house and they will soon come straggling out, often over a period of many weeks. Pin them with *silver* pins to avoid verdigris.—A. Thurnall; Wanstead, November 12th, 1910.

Emergence of Cossus Ligniperda.—With reference to Mr. Robert Adkin's note on *Cossus ligniperda* (*ante*, pp. 315), I have had some little experience in breeding and noting the emergence of this interesting moth. I have always noticed that the pupa protrudes a great part of its length during and after the emergence of the moth through the cocoon, and in some cases where the cocoon is buried at some little depth, either in earth or wood, showing through this also. On numerous occasions in the breeding cage I have been able to watch the commencement of the emergence, when the head of the pupa breaks through the cocoon and gradually by movements almost imperceptible works itself partly out of the cocoon, then resting awhile before the moth actually commences to burst away the head of the pupa and work its way out and crawl to some suitable spot to expand and dry its wings, though in a good many cases it will cling to the cocoon to dry these. I have a piece of decayed willow with cocoons and earth, measuring 5½ in. × 4 in. × 3 in., from which fourteen *Cossus* emerged this year, and I think I had every one under observation while they came out: seven on June 26th; one male on the 27th; one male and two females on the 28th; one female on the 30th and two females on July 1st. In all cases they commenced breaking through the cocoon between 1.15 and 2 p.m. and were clear and commencing to expand, the earliest at 2 p.m., and the latest at 2.40.—Laurence S. Hodson; Maisonnette, Palmers Green, N., November 14th, 1910.

Leucania loreyi, &c., in the South of Ireland; Leucania vitellina, &c., in Kent.—Among a number of Lepidoptera captured this year in the neighbourhood of Queenstown by my friend Commander R. S. Gwatkin-Williams, R.N., and which he sent to me to determine for him, was a fresh-looking example of *Leucania loreyi*. Upon writing for further particulars, Commander Gwatkin-Williams informs me that he beat the moth from ivy-bloom on his garden wall, about thirty yards from the sea, on October 6th. The night was fine and clear but rather cold, and calm, after a succession of south-easterly gales. It was a male in bright and perfect condition, with the exception of a small slit in one of the hind wings, which was probably done at the time of capture; the fringes were entire, and I should imagine it had not flown far. It is much paler than the figure given in South's 'Moths of the British Isles,' plate 149, fig. 6; but Newman's figure, No. 444, of 'Illustrated Natural History of British Moths,' gives a very good idea of it. The larva and food-plant are apparently unknown, so far as I can ascertain from books in my possession. If, however, anything should be known about either, I shall be glad of information on the subject. Among the other insects sent for determination I found *Dianthœcia cæsia*, *D. capsophila*, *Leucania straminea*, *Tapinostola fulva*, *Hydrœcia micacea*, &c., all captured in the same locality. Commander Gwatkin-Williams only began collecting two or three years ago, and last year he sent me some insects he had taken in Kent to name for him, and among them I found a couple of *Leucania vitellina*, *C. fluctuosa*, *Argyrolepia æneana*, &c. The *vitellina* were taken at sugar, near Sheerness, late in September. It is proverbial how lucky beginners are!—Gervase F. Mathew; Dovercourt, Essex, November 16th, 1910.

The Raynor Grossulariata, and the Turner Collection.—On Tuesday, October 25th, just over two hundred specimens, all more or less remarkable varieties of *Abraxas grossulariata* reared by the Rev. Gilbert H. Raynor, were offered at auction at Stevens's Rooms. It was not the first time that such varieties of the species had been disposed of. It will be remembered that some three years ago (October 22nd, 1907, Entom. xl. p. 294) Mr. Raynor sold his collection of British Lepidoptera, and included with it were a number of aberrations of *A. grossulariata* that he had accumulated during his pedigree breeding experiments with this species. The more direct results of the said experiments were, we believe, presented with their data to the Cambridge University Museum. Since that time Mr. Raynor appears to have devoted a large measure of his energies to rearing this species with a view to obtaining varieties, and those offered on October 25th included the more abnormal forms. Among them were some truly remarkable specimens, but it is doubtful, having regard to the very scanty data with which each of the two hundred and odd lots into which they were divided was accompanied, whether they were of any great scientific value. "Lancs. ex No. 4. 08. Bred 22. vi. 09. Raynor," for example, may be all very well in its way, but it conveys no intelligible meaning to one's mind. Indeed, one would suppose that, to fully appreciate their bearing upon any particular lines of variation that the species might be taking, it would be necessary to have the whole of the specimens comprised in the various generations leading up to these extreme forms before one; but as they stood, lot by lot, they conveyed little information beyond the fact that in certain conditions of interbreeding, which were not disclosed, forms dissimilar to any found under natural conditions might be produced. No doubt Mr. Raynor has this information, and it is to be hoped that some day he may see his way to publish it in such a form that the meaning of these remarkable aberrations may be apparent. This present lack of detail did not, however, prevent very high prices being obtained. A large, almost unicolorous, pale buff, example with black markings along the costa, catalogued as "Wonderful female, combining *nigricostata* with *lacteasparsata*," brought £11, which is, we believe, a record for any variety of this species; and a somewhat similar but slightly smaller specimen £7 10*s*. Three typical pairs of ab. *lacticolor* sold at 15*s*., 14*s*., and 14*s*. per pair, respectively, while various modifications of this form sold separately brought from 5*s*. to 37*s*. 6*d*. each, the latter price being for an "extreme var., with all markings on fore wings much suffused." Ab. *chrysostrota* varied between 8*s*. and 30*s*. apiece, and ab. *iochalca* between 7*s*. and 52*s*. 6*d*., the more typical specimens apparently being the least sought after. Two female *gloriosa* sold for 45*s*. and 42*s*. each, and one described as "Magnificent, with three-fourths of fore wings solid black and chocolate intermixed," ran up to six guineas, while several ab. *nigricostata* brought from 35*s*. to 70*s*. apiece, and sundry *centralipunctata* and its modifications realized from 14*s*. to 30*s*. per specimen. Three pairs of ab. *albipalliata* sold at 17*s*. to 22*s*. per pair, ab. *flavipalliata* at 11*s*. to 30*s*. each, while a couple of fine richly-coloured examples brought 60*s*. and 55*s*., respectively, and "an extraordinary iridescent female" 65*s*., the total realized for the two hundred and odd lots being nearly as many pounds.

In contrast with the scramble for the above-mentioned curios was the apparent apathy displayed towards the collection of Lepidoptera formed by Mr. E. Turner which was then offered. The specimens were, as a rule, in good order, but, except in the case of some few of the rarer species, without any data; and perhaps for this reason, as on some former occasions, many of the lots of the more ordinary species were disposed of with difficulty, sometimes two or three lots having to be lumped together before a buyer could be found even at a few shillings. The highest price given for *Polyommatus dispar* was 65*s*., others going at 63*s*., 60*s*., 20*s*., and two together for 18*s*. A lot containing eight *Thecla pruni* and some seventy other hairstreaks brought 20*s*., and another in which seven *Sesia scoliiformis* and six *S. sphegiformis* (bred; Sussex) were included, 18*s*. Two pairs of *Lælia cœnosa* (H. Doubleday, 1851, from Rev. Joseph Green's collection), 30*s*. per pair; a rather nice specimen of *Lasiocampa ilicifolia* (R. Weaver, from Rev. J. Green's collection), 45*s*.; and *Hydrilla palustris* taken by E. Turner, Wicken Fen, June 7th, 1907, 35*s*. Two males of *Cleora Viduaria* (H. Doubleday, 1851) were sold for 18*s*.; a lot of 147 geometers, in which a variety of *Zonosoma trilinearia* without markings was included, made 7*s*.; and one of 111, among which was a "black" form of *Acidalia aversata*, 14*s*.; and a fine light variety of *Triphæna fimbria*, one of two taken at Folkestone, July, 1905, 47*s*. 6*d*.—R. A.

CAPTURES AND FIELD REPORTS.

Micro-Lepidoptera at Malvern Wells and West Malvern.—I spent the last week of July, 1910, at Malvern Wells, and I took or observed the following species:—*Botys ruralis*, *Crambus perlellus*, *C. culmellus*, *Mimæseoptilus pterodactylus*, *Tortrix unifasciana*, *T. viridana*, *Dictyopteryx læflingiana*, *Grapholitha penkleriana*, *G. nævana*, *Symæthis oxyacanthella*, *Swammerdammia griseo-capitella*, *Orthotelia sparganella* (pupa), *Monochroa tenebrella*, and *Argyresthia nitidella*. These were all taken on the Worcestershire side of the hills. In the Croft Farm Woods I took, on July 27th, *Scopula olivalis*, *Crambus culmellus*, *Dictyopteryx forskaleana*, *Hedya dealbana*, *Grapholitha penkleriana*, *Pædisca corticana*, *P. occultana*, *Ephippiphora tetragonana* and *Argyresthia nitidella*. As so few lepidopterists collect Micros, I make it a practice to send my list of observations when away from home, however meagre they may be, for the benefit of those who keep the records for their respective counties. Much pleasure is to be derived from studying these small creatures, and they help to swell the bag when Macros are few and far between. Among the latter the two best things observed were *Acidalia emarginata* (a female) and *Triphæna interjecta*, both near Malvern Wells, the former laying several ova, from which I have larvæ hybernating. Mr. E. A. Atmore, King's Lynn, has kindly verified a few of my captures about which I was not reasonably certain.—G. W. Mason; Barton-on-Humber.

Scarcity of Wasps in the New Forest.—During the past summer and autumn wasps have been more than scarce; in fact, I have seen only two—the one flew into the house during the latter part of September, and the other I found in my sweeping net about the same date. This seems all the more curious as in the spring the queens were exceptionally common. Members of the local horticultural society are congratulating themselves on having exterminated wasps, as prizes are given each year to those persons who kill the largest number of queens; the number sent in this season being over three thousand. Although this slaughter may account for the scarcity in a measure, it is not a satisfactory explanation, as I hear reports of a similar dearth of wasps from other parts of the New Forest, where insect-hunting horticultural societies do not exist.—G. T. Lyle; Brockenhurst, October 22nd, 1910.

Scarcity of Wasps in the Chichester District.—There has been a great scarcity of wasps here, and in the neighbourhood, this year. My gardener tells me that he has not seen a single nest. In contrast with the paucity of wasps has been the extraordinary number of flies (*Musca domestica*), which have been a cause of considerable annoyance in many ways.—Joseph Anderson; Alre Villa, Chichester, October 26th, 1910.

Occurrence of Nyctibora sericea, Burm., a West-Indian Cockroach, in the Isle of Wight.—A fine specimen of this cockroach has been recently presented to the British Museum by J. Taylor, Esq., of Sandown, Isle of Wight. It was found in that town among bananas imported from Jamaica about mid-summer, 1906. I have not been able to find any previous record of this species in Britain, no mention being made of it in Barr's 'British Orthoptera.'—G. Meade-Waldo.

Cyaniris argiolus in October—I have a specimen of *C. argiolus* taken on October 29th, 1899, in my kitchen garden at Greenhithe. It is a female, absolutely perfect; in fact, it had only just dried its wings on some ivy in the hedge.—A. B. Farn; Breinton Lodge, near Hereford, November 3rd, 1910.

[Mr. Dennis (Proc. S. Lond. Ent. and Nat. Hist. Soc. 1902, p. 106) states that on October 9th of that year he found all stages of *C. argiolus* among ivy at Earl's Colne, Essex.—Ed.]

SOCIETIES.

Entomological Society of London.—*Wednesday, October 19th*, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair. —Dr. A. Feynes, M.D., of 61, East Colorado Street, Paradena, California, U.S.A.; Mr. Thomas Henry Geary, of Enderby, Leicestershire; and Mr. Edward Barton White, M.R.C.S., L.R.C.P., of the City Mental Hospital, Cardiff, were elected Fellows of the Society.—

Mr. A. M. Lea sent for exhibition two interesting examples of *Lissotes* beetles, which he had presented to the British Museum (Natural History) Teratological Collection: *L. curvicornis*, Ber. var. 3, with an additional leg jutting out from the left front coxa; and *L. punctatus*, Lea, an hermaphrodite having the left side male and the right female.—Mr. H. St. J. Donisthorpe exhibited an example of *Helcon ruspator*, L., a Braconid new to Britain, taken at Cannock Chase on the 16th July last, in a cell of *Strangalia 4-fasciata* in a fallen birch tree, and an example of the host captured at the same time. He pointed out that this very fine addition to the British List is recorded as parasitic on the same beetle on the Continent.—Mr. P. J. Barraud showed examples of two new forms of *Melitæa aurinia* from Italy:—(*a*) var. *aurunca*, Turati, from the Aurunci Mountains, southern central Italy, first discovered in May, 1909, by Sig. Querci, of Formia, the most striking feature of which is the wide black median band on the upper side, contrasting with a rather pale ground colour, and (*b*) var. *comacina*, Turati, from above Como.—Mr. A. E. Gibbs exhibited a case of butterflies containing a representative collection of the twenty-eight species met with by him at Blidah and Hammam R'Irha, &c., during an entomological excursion to Algeria made at the end of May and the beginning of June this year. The weather was extremely bad throughout, being cold, wet, and windy; the most interesting species taken in the first-mentioned locality were *Euchloë eupheno* and *Cœnonympha arcanioides*; in the latter, *Dryas pandora* and *Melitæa ætheria* var. *algerica*.—Mr. W. J. Kaye exhibited many remarkable wasp-like and beetle-like Syntomidæ, with their models, the wasps and beetles from British Guiana, South-east Brazil, and Venezuela. Attention was particularly drawn to the wonderfully close habits of the one to the other, so much so that it was impossible in some instances to distinguish the moth from the model until it settled. This was especially the case with *Pseudosphex noverca* and the wasp *Zethus binodis* which Mr. Kaye had caught on *Ageratum* flowers at Fernandes Pinheiro, in Parana. A new species of *Pseudosphex* was taken with the Vespid *Meganthopus cassununga*. These two insects so closely resembled one another that, even at a distance of eighteen inches or less, it was not an easy matter to distinguish them. From Caracas, Venezuela, were shown the Syntomid *Macrocneme lades*, with a Pompilid wasp of an undescribed species. The two insects had been caught flying together. In the discussion which followed, the President said that cases of close similarity with insects of different orders were always welcome, and that in this instance Mr. Kaye had shown that the resemblance extended not only to outside appearances, but to the habits of the several mimics and their models. Arguments based upon cabinet specimens alone as to the supposed resemblance of originals in the field were to be accepted with caution. Mr. J. W. Tutt, Mr. C. J. Gahan, Mr. G. C. Champion, the Rev. F. D. Morice, Mr. A. Sich, and Dr. Chapman also joined in the discussion.—Mr. E. D. Nevinson showed bred series of *Xanthia ocellaris* developing three distinct aberrant forms, and examples of *X. fulvago* and *X. gilvago* for comparison, the exhibit demonstrating the apparent transition from one species to the other through the typical and variant forms. The only other series bred from British ova by Mr. Mills in 1908 displayed no variation of any kind, and were all typical specimens.—The Hon. N. C. Rothschild exhibited a number of Anthrocerids captured in Great Britain, and called attention to some remarkable specimens secured at Ashton Wold, Oundle, which belonged to the form known as *Anthrocera hippocrepidis*. The exhibitor also showed some very large specimens of *A. filipendulæ* from the same locality, and pointed out that this large race had apparently exterminated *A. hippocrepidis* in a locality where that species had only recently appeared.—Mr. J. W. Tutt said that he had also found *A. hippocrepidis* confined to rough pastures, and also with a tendency to die out in one spot and appear in a similar at no great distance. It was usually on the wing in June, early or late, according to season, but in the same season well ahead of *A. filipendulæ*. The two other sets of Anthrocerids exhibited by Mr. Rothschild he thought were *A. filipendulæ*.—Sir George H. Kenrick communicated a paper "On some Undescribed Butterflies from Dutch New Guinea."—Mr. A. E. Wileman read a paper on "New Species of Heterocera from Japan."

Wednesday, November 2nd, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—Mr. H. E. Andrewes, of 8, North Grove, Highgate, N.; Mr. J. R. Charnley, of Lyndhurst, Fulwood, Preston; the Rev. Archibald Downes-Shaw, of Kettlestone Rectory, Fakenham, Norfolk; Mr. G. E. Frisby, of 40, Windmill Street, Gravesend; Mr. O. M. Schmidt Göttmann, of 2, Forest Villas, Whipps Cross Road, Leytonstone, N.E.; Mr. Ernest Purnell Jones, of 7, Nantwich Road, Crewe; and Count Emilio Turati, of 4, Piazza S. Alessandro, Milan, were elected Fellows of the Society.—The President handed round for inspection a copy of the plaquette designed in honour of M. J. H. Fabre, of Sérignan, Vaucluse, an Honorary Fellow of the Society.—Professor T. Hudson Beare exhibited examples of the rare British beetle *Pterostichus aterrimus*, recently taken by him at Stalham, Norfolk.—Commander J. J. Walker brought for exhibition the following rare Coleoptera:—(*a*) a specimen of *Lathrobium longipenne*, Fairm., a beetle recently introduced as a British species, taken at Tubney, Berks; (*b*) a specimen of a remarkable ants'-nest beetle, communicated by Mr. C. French, from the Atherton district, N.S.W., and described by Mr. A. M. Lea under the name *Tretothorax cleistoma*, representing a new family of Coleoptera, the Tretothoracidæ; also the ant with which the beetle was found;. and (*c*) two specimens of *Thomosis guanicola*, Broun, a beetle allied to *Sphæridium*, &c., taken by Dr. L. Cockayne among penguin guano on the Bounty Islands, 490 miles south-east of New Zealand. Mr. G. C. Champion was of opinion that this beetle was a member of the Heteromrous section of the Coleoptera, and Mr. G. J. Gahan that it belonged to the newly constituted family Rhypsopaussidæ.—Mr. R. J. le B. Tomlin brought for exhibition examples of the following British Coleoptera:—(*a*) *Macronychus 4-tuberculatus*, Müll., recently rediscovered in the River Teme; (*b*) *Enicmus histrio*, Joy and Tomlin, sp. nov.; (*c*) *Laccobius regularis*, Rey, from small *sphagnum* pools at Newbury; (*d*) *Cionus longicollis*, Bris., taken at Harewood Forest on

Verbascum thapsus on June 26th, 1909, the only previous capture in Britain being by Mr. Moncreaff at Portsmouth in 1871; and (*e*) *Bembidium tibiale*, Duft., a melanic example taken this summer by the River Monnow. Mr. Tomlin also exhibited, on behalf of Dr. David Sharp, F.R.S., examples of *Laccobius ytenensis*, Sharp, sp. nov.; and *Crepidodera impressa*, Fab., a littoral species recently introduced to the British list by Dr. Sharp from Hayling Island, since found in an exactly similar locality at Poole Harbour by Colonel Yerbury.—Mr. G. T. Bethune Baker showed an Asilid which he had taken at Macugnaga in August, with a dead female *Nomiades semiargus* in its mouth.—Professor E. B. Poulton, F.R.S., said that undoubtedly the Asilids inject, through the proboscis, a poison into their prey which kills them immediately.—Mr. H. St. J. Donisthorpe showed a specimen of *Claviger longicornis*, Müll., with its host *Lasius umbratus*, Nyll., taken by Father Schmitz in Germany. He said this species should occur in Britain with the same ant, and Father Schmitz had told him that April was the best month in which to look for it in the nests of *umbratus*, under deeply embedded, heavy stones.—Dr. T. A. Chapman exhibited a teratological example of *Pterostoma palpina*, one of a number of similar specimens bred from one brood of larvæ, and which may be called as a varietal (or aberrational?) name, var. *brevipennis*; also, on behalf of the Rev. C. R. N. Burrows, a specimen of malformation of the male appendages in *Acronycta tridens*, no similar specimen having been recorded.—Mr. H. M. Edelsten exhibited a bred example of *Leucania l-album*, obtained from ova laid by a female specimen taken by Mr. E. P. Sharp (Entom. vol. xlii. p. 322 (1909)). The species is double-brooded on the Continent, emerging in May to June and August to September; the first brood in this country might therefore have been overlooked, as the larvæ seem hardy enough.—Mr. R. South showed an exceedingly interesting and rather variable series of *Luperina gueneei*, Doubleday, sent him by Mr. W. Yates, of St. Anne's-on-Sea, who obtained them, chiefly this year, on the Lancashire coast. The first specimen in the series agreed well with the original description of *L. gueneei*, the others showed the typical ochreous coloration but were variable in marking. Mr. Yates considered four of the specimens melanic forms of *L. gueneei*, but the exhibitor expressed his opinion that they were certainly dark aberrations of *L. testacea*, probably referable to ab. *nigrescens*, Tutt. Mr. South also exhibited three of six specimens of *Oria* (*Synia*) *musculosa*, taken in the Salisbury district, in August, 1909, by Mr. H. Haynes, who captured others in August of the present year. The hind wings of the specimens exhibited were darker than those of most British or Continental specimens in collection.—Mr. F. C. Oldaker showed a case containing various aberrant forms of Lepidoptera, including (*a*) a very darkly marked example of *Argynnisa glaia*, from Switzerland; (*b*) examples of *Polygonia c-album* bred from ova, including one specimen, a female, of a very pale form; (*c*) a series of *Noctua ditrapezium*, including a form in which the ground colour of the fore wings is almost uniform dark reddish brown, the usual black markings being only slightly darker than the rest of the wing, and very faintly discernible; and (*d*) a series of *Epione advenaria*, bred from ova at Haslemere, 1907; one of a remarkable race very much smaller than usual, and of a uniform dull brown colour, with white fringes, but no markings on the wings (Entom. vol. xli. p. 157), being similar to the male recorded (Entom. vol. xliii. p. 201) by Captain Cardew.—Mr. A. H. Jones exhibited a series of *Melitæa dictynna* var. *vernetensis*, Obth., taken by him this year at Vernet-les-Bains, Pyrénées-Orientales, and said that he regarded the so-called variety as probably a distinct species. With it he also showed examples of *M. dictynna* type, and *M. athalia* for comparison.—Dr. Malcolm Burr, D.Sc., M.A., communicated a paper entitled "A Revision of the Labiidæ, a Family of Dermaptera."—The Rev. F. D. Morice read a paper entitled "Hymenoptera Aculeata collected in Algeria: The Sphegidæ," being part v. of the work commenced by the late Edward Saunders, F.R.S., F.E.S., in the Trans. Ent. Soc., 1904, p. 515.—Professor E. B. Poulton, D.Sc., M.A., F.R.S., communicated a paper entitled "Experiments with the Larva and Pupa of *Uropteryx sambucaria* in Connection with their Colour Surroundings," by Elizabeth Bridges. At the close of the discussion which followed, the President proposed a special vote of thanks to Miss Bridges, who was present, and this was carried unanimously.—H. ROWLAND-BROWN, M.A., *Hon. Secretary.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*August 25th.*—The President in the chair.—Mr. Adkin exhibited a series of *Hesperia malvæ*, and read notes on the peculiar resting habit of the species.—Mr. Edwards, a box of Satyrinæ, and called attention to the varied local forms of *Ergolis ariadne*.—Mr. West (Greenwich), a series of the rare homopteron, *Typhlocyba cruenta*, from Box Hill, and specimens of *Oncotylis viridiflorus* from Ranmore.—Mr. Newman, an intermediate form of *Odontopera bidentata*; a female *Bithys quercus* with *adonis*-blue blotches on fore wings; bred examples of *Argynnis paphia* var. *valesina*; a female *Euchloë cardamines* with a thin streak of bright yellow scaling on the left fore wing, and another much darker at base of wings, with aberrant marbling on the under side; a partially gynandromorph of *Amorpha populi*; and a very darkly marked specimen of *Pseudoterpna pruinata* (*cytisaria*).—Mr. Hugh Main, the larva of a glowworm.—Mr. W. J. Kaye, a long series of *Morpho cytheris* (*thamyris*), taken by him at Castro Parana, South America.—Dr. Chapman, rich brassy examples of *Anthrocera filipendulæ*, and specimens of *Pieris rapæ* from near Hospenthal, of large size and single-brooded.—Mr. Sich, a specimen of *Aventula flexula* from Wisley, a series of *Coleophora albicosta* from Sheen, and a cocoon and imago of *Nepticula centifoliella*.

September 8th.—Mr. A. Sich, F.E.S., Vice-President, in the chair.—Mr. P. Barrett exhibited bred *Hyles euphorbiæ* from Sicily; also a number of reeds from which larvæ and pupæ of *Nonagria arundinis* had been extracted by birds.—Mr. Ashby, a series of *Anomala frischi* from the New Forest, three-fourths of which were of the beautiful blue-green variety.—Mr. West (Greenwich), a short series of the rare Homopteron, *Oliarius leporinus*, from Holmsley, New Forest.—Mr Newman, long varied series of *Agrotis cinerea* from N. Kent, and *Pachnobia alpina* from Rannoch, *Euchelia jacobææ* with red markings united, a number of *Spilosoma fuliginosa* bred in August from Aberdeen ova, laid in June, of the red southern form, and a varied series of *Amorpha populi*, including a unicolorous specimen and one with a greenish band.—Mr. Step, for Mr. Bishop, a cluster of *Drosera intermedia* from Cut-mill, which had captured a dragonfly *Agrion puella*.—Dr. Hodgson, a gynandromorphous *Brenthis euphrosyne* from Ashdown Forest.—Mr. Sich, shells of the ova of *Coleophora niveicostella* on thyme, cases of *C. potentillæ* (?) and of *C. parvipennella*, and mines of the larvæ of *Cemiostoma scitella*, in hawthorn.—Dr. Chapman showed a series of slides illustrating various, chiefly structural, points in relation to the "blues," especially *P. argus*, *A. corydon*, and *A. thetis* (*bellargus*): their larvæ at various stages, characteristic hairs, honey glands, &c.; pupal structure, such as the curious pocket in *P. argus* and *A. thetis* between segments four and five of the abdomen, to receive the ends of the legs and antennæ; the male appendages, to illustrate their characteristic forms in the Plebeiids; a series of specimens of the teeth at the end of the clasp of *P. argus* and also of a number of allied species, showing the great variation of these parts in *P. argus* and quite impossible to confound with the other species, where variation might be equally great, but specimens were not available for this. The specimens were all pressed quite flat so as to be perfectly comparable.

September 22*nd*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Dr. Chapman exhibited a bred series of a second brood of *Agriades corydon* from ova laid by spring imagines taken in the Riviera.—Mr. West (Ashtead), a bred series of *Malacosoma neustria*, containing a good proportion of very light and very dark forms in both sexes.—Mr. Andrews, short series of the Diptera, *Pegomyia setaria* and *Isopogon brevirostris* from Chattenden and Shoreham, Kent, respectively.—Mr. Newman, a *Celastrina argiolus* female with very wide black margin and spotted fringe, a *Pachnobia hyperborea* in which a radial segment of the hind wing has the rich markings of the fore wing, an orange *Arctia caja* with fore wings having only a few small blotches of dark marking, several forms of *Angerona prunaria* uniform and rich marbled, an *Adopæa lineola* with xanthic discal patches on all wings, and an *Abraxas grossulariata* extremely pale, with only a few scattered traces of black and yellow markings.—Mr. Kaye, for Mr. Percy Richards, a curious and unique specimen of the genus *Zanclognatha* with a combination of the markings of both *Z. grisealis* and *Z. tarsipennalis*, but considered as being the former species.—Mr. Step, the galls of *Cynips kollari* (?) from Bookham and compared them with *C. tinctoria* (?) brought from the Riviera by Dr. Chapman.—Mr. Turner, a box of Geometers which he had received from West Australia and was going to hand to Mr. Prout for identification.—HY. J. TURNER, *Hon. Rep. Secretary*.

RECENT LITERATURE.

Memoirs of the Department of Agriculture in India. Entomological Series, vol. ii., No. 8. "Life-Histories of Indian Insects.—Coleoptera I." By H. Maxwell-Lefroy, M.A., F.E.S., &c. Pp. 139–163, plates xiii.-xix. (June, 1910.) Thacker, Spink & Co., Calcutta and London.

Deals with the life-histories of seven Indian beetles—*Phyllognathus dionysius*, *Anomala varians*, *Galerucella singhara*, *G. rugosa*, *Apomecyna pertigera*, *A. histrio*, *Cylas formicarius*, and *Cionus hortulanus* var. *major*. The various stages of all these insects, except *A. histrio*, are beautifully depicted on the plates.

The following have also been received :—

An Introduction to the Study of Rocky Mountain Bees. By T. D. A. Cockerell and W. W. Robbins. Pp. 179–195, with eight plates of figures showing wing and other structural details. (Reprint from 'University of Colorado Studies,' vol. vii., No. 3; Boulder, Colorado, March, 1910.)

The Type-Species of the North American Genera of Diptera. By D. W. Coquillett. (Reprint from 'Proc. U.S. Nat. Mus.,' vol. 37, pp. 499–647, Aug. 4th, 1910.)

Hawaiian Sugar Planters' Association. Division of Entomology. Bulletin 207.—"Army Worms and Cut Worms on Sugar-Cane in the Hawaiian Islands," by O. H. Sweezey (pp. 32, plates 3). Bull. No. 8.—"A Bibliography of Sugar-Cane Entomology," by G. W. Kirkaldy (pp. 72).

Insects and Entomologists: their Relations to the Community at Large. By Professor John B. Smith. Pp. 209–226 and 467–477. (Reprint from the 'Popular Science Monthly,' March, May, 1910.)

Injuries to Forest Trees by Flat-headed Borers. By H. E. Burke. (From 'Year-book of Department of Agriculture for 1909,' pp. 399–415.)

U.S. Department of Agriculture. Bureau of Entomology : Technical Series :—No. 18 : "The Anatomy of the Honey Bee," by R. E. Snodgrass. No. 19, pt. i. : "The Parasites Reared or supposed to have been Reared from the Eggs of the Gipsy Moth," by L. O. Howard, Ph.D. Part ii. : "Descriptions of Certain Chalcidoid Parasites," by J. C. Crawford.

Bulletins :—64, pt. viii. : "The Woolly White Fly : a New Enemy of the Florida Orange," by E. A. Back, Ph.D. 80, pt. v. : "On the Nut-feeding Habits of the Codlin Moth," by S. W. Foster. 82, pt. iv. : "The Life-History and Control of the Hop Flea Beetle" (*Psylliodes punctulata*), by William B. Parker. 85, pt. iii. : "The Clover-root Curculio," by V. L. Wildermath. pt. iv. : "The Sorghum Midge (*Contarinia sorghicola*, Coq.)," by W. Harper Dean. Pt. vi. : "Contributions to a Knowledge of the Corn Root-Aphis," by R. A. Vickery. Pt. viii. : "The Cow Pea Curculio," by Geo. G. Ainslie.

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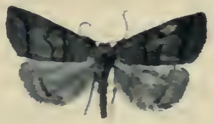
ZANCLOGNATHA GRISEALIS, AB.



The above curious aberration of *Zanclognatha grisealis* was captured at Wye, in Kent, by Mr. Percy Richards, on June 3rd, 1910. Compared with normal specimens it is rather larger in size and somewhat paler in colour; the lines are blacker and thicker. The chief peculiarity of the specimen is that the first and second lines are close to each other; the former is straight as usual, but nearer the middle of the wing; the latter is obtusely angled at end of the cell, touches the first line on the costa, and approximates thereto on the inner margin.

This species is a fairly constant one. It certainly exhibits slight variation in the tone of ground colour, but aberration in marking would seem to be very exceptional.

Richard South.

NOTES ON THE LIFE-HISTORY OF *PARARGE HIERA*, Fabr., WITH DESCRIPTION OF THE FULL-GROWN LARVA.

By W. G. Sheldon, F.E.S.

Whilst at Semmering last June I confined several females of *Pararge hiera* over plants of various grasses for ova, which were deposited sparingly; in all I obtained about three dozen, the ova, which were light green in colour, being of the usual round Satyrid form, and affixed in ones and twos by the parents to a blade of grass very near the apex; in no case were they more than one inch from it.

The ova, on my return to England, were kept in a room which had an average indoors summer temperature, and the larvæ emerged at the end of the month. Shortly after emergence they were transferred to a greenhouse which in the summer is kept without artificial heat, the door and top-lights in the day open, and the roof shaded by tomato-plants. Under these conditions the average temperature would be somewhat warmer than that of the surrounding atmosphere not protected by glass, especially at night. The larvæ throughout fed slowly, showing no tendency to produce an autumnal emergence of imagines, and the first one did not pupate until the end of August; two others, the only ones to reach maturity, did not commence to change until the middle of September. I tried them on various grasses, but the only one they would eat freely was *Dactylis glomerata*, and, so far as I was able to see, they fed exclusively by night, remaining stretched out at full length on their food-plant during the day.

The full-grown larva is about 30 mm. in length when stretched at rest on a blade of grass. The head is very rounded and prominent, and much wider than the second segment, which gives the larva the appearance of having a distinct neck; it is grass-green in colour, thickly sprinkled with lighter tubercles, each one of which emits a green spine; the ground colour of the remainder of the segments is of the same tint of green as the head, but lighter, and the tubercles and spines are at much greater intervals. The centre of the dorsal area from second to anal segments is darker than the rest, and is bounded on the sides by green stripes of lighter colour than that of the general area; these two stripes are each about one millimetre in width in the centre, and taper off at each end, those towards the anus terminating in points; half-way between these stripes and the spiracles are another pair of stripes which have the upper margins of the same dark colour as the mid dorsal area, and which gradually shade off below to the colour of the general surface, the spiracles being green and inconspicuous. In the spiracular area is another pair of stripes of the same tint as those previously described. The anal points are light green and very spiny; the ventral is of the same colour as the dorsal area.

Pupation is certainly not subterraneous; the three larvæ which eventually became pupæ attached themselves by the anal extremity to a pad of silk spun on the roof of the cage, but did not seem to have the strength to retain that position, and before changing, or possibly in the act of changing, fell to the soil on the floor of the cage and changed there; probably a cold snap which just then intervened was responsible for this. The pupa is green, of the same tint as the larva, and is about 12 mm. long.

There seems some doubt as to whether this species is usually double-brooded. It is true that Dr. Kane and Dr. Lang give the emergence as from May to July, but, as the species occurs in Central Europe from about 2000 ft. to considerably over 5000 ft., the difference of altitude would account for this variation of dates, without assuming that there was more than one brood; but Mr. Wheeler, in his 'Butterflies of Switzerland and the Alps of Central Europe,' gives two records which seem to prove conclusively that—in some instances, at any rate—*Pararge hiera* is double-brooded; they are "Gruyères, August 30th, 1897 (Rowland-Brown)," and "Certosa di Pesio, June and end of August, 1892 (Norris)." Both of these localities are at about 2000 ft., and therefore it seems probable that *P. hiera* is a single-brooded species everywhere except at the lowest levels on which it is found. I may mention that the females captured by me at Semmering were taken at an altitude of from 3000 ft. to 3500 ft.

[Prior to the publication of Mr. Sheldon's paper it may be safely assumed that no British entomologist had successfully bred *Pararge hiera* through all its earlier stages. However, Herr J. Peyron, a member of the Entomological Society of Stockholm (Ent. Tidskrift, 1905, pp. 249–251), supplements Spuler's scanty note on the larva (Raupen Gross-Schmette. Europas, p. 50) with an excellent life-history of the species, including many interesting observations additional to and confirming Mr. Sheldon's.

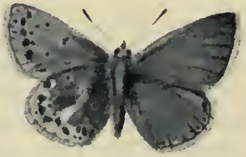
The larva is hatched eight days after oviposition, and pupates after three moults only, "as is the rule in the genus *Pararge*," extended over six weeks in all. Under natural conditions the pupa is suspended head downwards from a blade of the food-plant (*Phleum pratense*), without other attachment ("fritt"), and in Scandinavia, as doubtless elsewhere where there is but one brood, passes the winter in this stage.

Spuler, quoting Dorfmeister, of Vienna, but without reference to any particular publication, gives *festuca* as the food-plant. Frionnet (Premiers Etats des Lépids. Fr., p. 263) supplements this with *holcus*, probably on the same authority, adding "larva from September to April," which, in the light of Herr Peyron's and Mr. Sheldon's researches, is obviously inaccurate.

As to the two emergences, Frey (Lepid. der Schweitz, Lemann's translation, p. 36) leaves us in no doubt. He writes: "Butterfly twice a year in the plains and hilly districts. First brood from the first days of May, and then in July and August." At greater altitudes there is only one emergence, as, for instance, in the Balkans, where Mrs. Nicholl found it very common on the Rilo Dagh, at about 5–6000 ft., in June (Elwes, "Butterflies of Bulgaria," Trans. Ent. Soc. Lond. 1900). I myself took it on the summit of the Stelvio in mid-July, 1900, but I regret to say that, on looking over my series, I can find none of those recorded as from Gruyères, my impression now being that certain small and dark examples of *Pararge mæra*, since arranged in their proper place and bearing a Gruyères label, are the then-supposed *hiera*. But, of course, this does not in any way affect the evidence of *hiera* being double-brooded there, and elsewhere at suitable levels.—H. Rowland-Brown.]

A POSSIBLE HYBRID OF *AGRIADES THETIS* ♂ AND *POLYOMMATUS ICARUS* ♀, OR OF *A. CORYDON* ♂ AND *P. ICARUS* ♀.

By T. Reuss.



Agriades hybrid.

The above figure represents an interesting "blue" taken by Mr. L. W. Newman, of Bexley, in mid-September last at Folkestone while drying its wings after emerging from the pupa. In the upper side facies the brilliant blue, the marginal black-and-white spotting in the hind wings,* strongly suggest the parentage of *A. thetis*, while the almost pure white (aberrative) fringes with some signs of the inner grey border of *P. icarus* in the apex and slight black projection of the veining in the anal and outer angle of the hind wing suggest the influence of *icarus*. The strong blackening of the nervures, however, reaches as far into the wing area as in *A. corydon*; the first black spot in the outer angle of the hind wing is also like that in *corydon*, and there are black and whitish scales mixed in with the blue ones in the margin of the fore wings, especially near the apex. These details may be aberrative,† but it is perhaps thinkable that a hybrid between *A. corydon* ♂ and *P. icarus* ♀ would exhibit a *thetis*-like facies, as described, with intensified black markings. The wings are less rounded than in *icarus*—they are more angular, as in *thetis*; their shape suggests the issue of a crossing between two differently-sized species. I do not know whether the displacement of the spots in the under side may be also counted as evidence in this direction.

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* I possess a male *P. icarus* aberration, recorded in the Ent. Rec., vol. xxi. pt. 9, which is strongly spotted in the hind wings upper side, and which, as I only now noticed and could verify with a lens, has some white scales mixed with the blue ones beneath some of the black spots, especially of those in the anal angle of the left wing.

† One must also be on the look-out for secondary sexual characters of both sexes in hybrids; hybridism favours their mixture. A black suffusion o the fore wing margin occurs sometimes in ♂ *P. icarus* ab.

In the under side there is something of *corydon* as well as of *thetis* and *icarus*; the colouring is very light, the hind wings are distinctly more yellowish than the fore wings, which are whitish, thus reminding of *corydon* ♂. There is no orange in the marginal lunules of the fore wings.

I am told that in the locality where the specimen was captured, at a time when *icarus* were worn and *thetis* were fresh, these *A. thetis* and *P. icarus* swarm, while *corydon* is rare. As the case stands, evidence seems very much to favour the verdict of *A. thetis* ♂ and *P. icarus* ♀ in decision of the parentage; but, on the other hand, I think that the traits of *A. corydon* in the specimen, if not readily explainable by aberration, are still sufficient to maintain a doubt.

I will name this interesting form after its captor, *Agriades* hybr. *newmani*.

NOTES ON A BUTTERFLY HUNT IN FRANCE IN 1910.

III.—Basses-Alpes and Isère.

By H. Rowland-Brown, M.A., F.E.S.

(Concluded from vol. xliii. p. 327.)

Since the publication of my last paper in December ('Entomologist,' xliii. pp. 322–327) I have had an opportunity of inspecting the little collection of butterflies made by Mr. Warren during our brief halt at Rosans (Hautes-Alpes). A Hesperiid taken by him there turns out to be a male of *Pyrgus proto*, in splendid condition, showing a decidedly greener under side than the specimens in my collection from Albarracin, and on the upper rather lighter than true Spanish forms. So far as I can gather, the discovery of this unmistakable species in the Hautes-Alpes constitutes a record, though it occurs at Digne, in the southern adjoining Department.

Meanwhile, it is with some diffidence that I proceed to give a short account of our entomological experiences in the Basses-Alpes. Digne is nowadays almost as well known to lepidopterists interested in the extra-British fauna as the New Forest district to those who confine their attention to the United Kingdom. Every year the number of those who "take their walks abroad" increases, and as surely as the fly gravitates to the honey-pot, or perhaps I should say, the moth to the treacle, so surely the "palæarctic" collector turns his steps towards the pretty little capital of the Basses-Alpes. I myself have visited Digne on six separate occasions during the past eleven years, but, curiously enough, this was the first July I ever spent there. Early April, mid-May, and mid-June, twice in August, and once even in October—these are my seasons, and as it had always been a case of "*semper aliquid novi*" in the past, so I looked forward to turning up something new again this year, especially as I was to spend considerably over a fortnight on the lavender-grown valleys, and upon the hot hills which surround the town.

We arrived at Digne in as heavy a thunderstorm as I ever remember to have encountered, the rain descending tropically; the night decidedly cool and pitch dark, and it was not until I threw open the shutters of my favourite room in the "Boyer-Mistre" next morning that I realized the surprises were not to be altogether entomological! The splendid plane avenue, the delight of so many summer evening's shade, had been shorn of its magnificence; the upper branches levelled with the house-tops, and the trunks left hopeless and forlorn! But the sky was clear, and municipal zeal had not extended itself to reforming the characteristic odours of the "Rue de Paradis" and the other crabbed alleys which lead to the Dourbes and the Eaux-Thermales roads. Yet here was another unwelcome spectacle. The garden espaliers, normally laden with fruit, were almost empty; the long lines of walnut trees covered with the charred festoons sered by a late phenomenal May frost—the cause of havoc to crops, orchards, and vines throughout the district, and, as we were soon to discover, to the insect life and wild flora as well.

With regard to emergences, everything appeared to be topsy-turvy. The earlier warm weather of spring had apparently brought out half a brood, leaving the other in abeyance until July. Some of the usually butterfly-haunted spots round Digne for several days produced next to nothing except shoals of *Rusticus argus* (*ægon*), of which I had actually a full-fed larva at the time I was taking perfectly fresh males and females, both sexes, as with other butterflies, appearing simultaneously. On July 7th, in the Eaux-Thermales Valley, males of *Papilio alexanor*, which in 1899 was out in the second week of June, were still quite fresh, this species, with *Parnassius apollo*, also in fine condition, practically constituting our bag that day; the wind being high and the temperature anything but suggestive of the southern summer. Remarkable also was the scarcity of Anthrocerids. Usually abundant in the abandoned vineyards and *garrigues* at the back of La Collette, on the 8th they were conspicuous only by their absence, and although we spent the whole of a fine warm morning there, hardly any butterflies were on the wing except *R. argus*, *Leptosia sinapis*, *Colias hyale*, *Satyrus cordula*, and *Polyommatus escheri*, Mr. Warren netting a single *P. admetus* var. *ripertii*. Matters mended, however, somewhat later in the day, when the Eaux-Thermales Valley yielded, in addition to the Papilionidæ mentioned above, *Argynnis daphne*—some worn, some quite perfect—*Gonepteryx cleopatra*, *Thecla ilicis*, *T. spini*, *Polyommatus hylas*, and the following "skippers": *Hesperia carthami*, *Thymelicus actæon* (males only, very common), and *Pyrgus sao*. Magnificently coloured females of *P. escheri* were also not infrequent. It was curious to observe, however, that of the earlier butterflies their size was abnormally small, and this in a locality noted for the grandeur of its examples. *Aporia cratægi* we came across here, as well as at the higher levels, were no larger than the males of *Limenitis camilla*. A male *P. hylas*, normally as large as our finest *P. corydon* at home, measures hardly more than a normal British male *R. argus*.

Our first expedition to the Dourbes was made on July 10th, but unfortunately after a brilliant morning—we started soon after 5 a.m.—the weather became cloudy at noon; that is to say, when we had been at the top somewhere about an hour, having missed the more direct road up the cliffs. Added to this, a furious wind preceded the departure of the sun, and it was with difficulty that we made any captures at all upon the actual ridge. Evidently here above, as on the lower ground round Digne, the emergence of many species had been arrested by the low temperatures of May. We were, in fact, among the spring butterflies again; though very few were in good condition. Remnants of *Erebia evias* indicated a rather plentiful generation, and there were quite a lot of *Parnassius mnemosyne* about, nearly all decidedly *passés*, but one or two males quite perfect! More remarkable still was the apparition of *Pararge hiera*, also wholly dilapidated; a species I do not remember to have seen recorded from the Dourbes heretofore, the reason no doubt being that few collectors who visit Digne earlier in the year think it worth while to ascend so high. The lavender, of course, was not out at this altitude, but the sides of the steep precipitous cliffs where *Erebia scipio* is fabled (?) to fly, were covered with flowers, and for the first time the Anthrocerids were seen in profusion; a particularly welcome find being the pretty little *A. gallica*, Obth., a new species to me. *Erebia stygne* was, however, the only butterfly in good condition that we came across otherwise than singly until we had once more returned to the glades of the pine forest, where, among the lush-green grasses and vetches, *Nomiades semiargus*, *Cupido minimus*, and *Everes coretas* were common enough, though we did not discover that we were disturbing the latter until almost out of the wood.

Five days later, on July 20th, a second expedition over the same ground produced little besides the butterflies already mentioned, with *Melitæa parthenie*, and, near Villars, on the way home after a very hot walk, *Polyommatus damon* (which curiously enough had not yet put in an appearance lower down in the Eaux-Thermales Valley at this date) and one or two fresh *Thecla acaciæ*.

Four days earlier, opposite the Bath Establishment Hotel ("*auberge*" would be a better name for it!), I encountered for the first time at Digne *Libythea celtis*, a single male of which, after hovering over some wild clematis just out of net-reach, flew up into the cherry trees and disappeared. But at the back of La Collette next morning Mr. Warren secured another male, and on the road that day we saw our first and last *Satyrus fidia*. Most collecting days were devoted, however, to the valleys of the Eaux-Thermales, and right in the river-bed, having scrambled down from the road after a fine female *P. alexanor*, we came upon what was evidently a favourite haunt of the hitherto elusive *Polyommatus admetus* var. *ripertii*, for with the males of *P. meleager*, now in all their glory, this was here the commonest of "blues." Both males, and in lesser numbers females, were flying in abundance over a dry, sandy promontory at the edge of a wood-path, where also the fine brilliant southern form of the female *Chrysophanus dorilis* frequented the flowers of a golden daisy, Mr. Warren netting one specimen almost of the ruddy copper-red of the male *C. hippothoë*. Nor did his successes with the Chrysophanids end here, for, as at Nyons, he was able to count among his spoils male examples of *C. alciphron* var. *gordius*, female ab. *midas*, Lowe. *C. virgaureæ* was hardly out, and I saw only an occasional male before leaving on July 23rd.

On the whole, *P. alexanor* was plentiful, and it was a great pleasure to watch the females ovipositing on the *young* plants of *Seseli montanum* practically wherever they grew, and on both sides of the Bléone River. They would hover a moment over an unoccupied stem, then settle, bowing the delicate filamentary shoots to the ground, and deposit a single egg at the junction of the leaf with the stem. On no occasion did I find two laid side by side, or anywhere near to one another, and the females seemed instinctively to discriminate plants already visited. About a dozen ova I carried home at different dates, and when Mr. Warren left for England on the 21st he took with him a small colony, some already in the second instar, of which I had small hopes, having been assured that a change of food-plant would be fatal to them. Yet they took quite kindly to the Amersham carrots; though all died from some unexplained cause in the third instar, leaving the life-history of the species still to be written and illustrated by a British authority! The range of this splendid *Papilio* no doubt is far more extended west and north in France than the local catalogues suggest. Mr. Warren tells me that he saw several from the train windows far north of Serres on the Digne-Grenoble line.

Very little rain fell during the whole time we were at Digne, but there was nearly always a high gusty wind, and at the commencement of our stay a disagreeable preponderance of cloud. And just as we arrived in a storm, so I left in a downpour, accompanied by thunder and lightning, the rain lasting right up to Clelles (Isère), my next stopping-place, and the night so cold that it might have been early spring instead of the height of the calendar summer. Grey and black, indeed, was the 24th, and so discouraging the outlook, that I did not take my net with me when at length I made up my mind for an afternoon walk. But the unexpected happened of course, and crossing a heap of stones covered with flowering-plants, I put up a magnificent black variety of *M. parthenie*—so black that I thought at first it must be an *Erebia*. I had my hat off in a minute; actually got it over my *parthenie*, and was just boxing it when a terrific puff of wind blew hat, pill-box, and butterfly out of my hand, and I saw the latter borne swiftly over a deep precipice! And that was about the only insect I saw on the wing that day, though there is plenty of good collecting ground all up the western valley, which opens on the railroad and the lower levels some little distance in the direction of Grenoble.

The next day being still cold but fine, I decided, therefore, to try over the same ground on the very off-chance as I thought of a similar encounter. To this extent I may count myself fortunate, for, at the very spot where I had missed *parthenie* the day before, I took the self-same specimen—recognized by certain rubbings of the wings; and on the way back, a couple of hours later, another almost identical, but absolutely perfect, suggesting that hereabouts a race of "black" *parthenie* was established, of almost the form which I find named and exquisitely figured ('Lépidopterologie Comparée,' fasc. iv. plate xliv.) by M. C. Oberthür as ab. *rhoio*, Obth. And in this connection I may add that I have yet another but much smaller example, apparently a like aberration of *M. parthenie* var. *varia*, M.-D., which was taken by me when collecting with my friend Mr. C. J. Johnson at the top of the Simplon Pass in July, 1907—another very fine dark aberration from the same ground being referable, I think, rather to *M. aurelia*. A few typical *parthenie* were also noted on the outskirts of the woods which were carpeted with *Melampyrum* in full flower, and with them not a few males of *Polyommatus damon* and *Chrysophanus virgaureæ*; the road attracting *Satyrus circe*, and the steep shaley banks *Parnassius apollo* and *Erebia stygne*, with occasional *E. ligea*.

But this was the last day of my collecting abroad for the season of 1910, which will be remembered by me as far the wettest and most disappointing for many years, in a country where sunshine, as a rule, can be relied upon throughout the summer, at all events out of the higher mountain districts.

Harrow, Weald: Dec. 1910.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from vol. xliii. p. 337.)

I have notes by Mr. Powell, with comments thereon by Mr. Sloper, on the larva of *M. deione* from the South of France. They are, however, written from such a different point of view, the comparison being made with *M. didyma*, and not with *M. athalia*, of whose earlier stages Mr. Powell, at the time these notes were written (1904), said that he had no distinct recollection, that I do not think anything would be gained in the present connection by copying them as they stand. Most of the details given would apply equally well to other species of this group, and there is no point specially remarked upon in which they differ from var. *berisalensis*. In sending these notes to Mr. Sloper, Mr. Powell enclosed some specimens of the food-plant, observing that the larvæ, when he received them from M. Foulquier, had eaten all the flowers of the plants sent with them; on this Mr. Sloper remarks that the food-plant is the same species of *Linaria* as that on which the larva of *berisalensis* feeds, and that the latter also eat the flowers in preference to the leaves. Mr. Powell's larvæ must, from the date (June 13th), have belonged to the second brood, and it may be observed that the first brood larvæ, after hybernation, can have no opportunity of indulging this taste, as their food-plant is not in flower during the early spring.

The larva of *britomartis* was described by Assmann as follows:—Size of a small *cinxia*; head and legs black, the former possessed on the upper surface of small raised spots of a white colour, on which are short black hairs; the cylindrical body, abdominal and anal legs pearly white, generally finely latticed with violet-grey; only one stripe on the back and two on the sides are somewhat strongly marked. The clean white warts have black hairs, and stand on fairly large rust-yellow spots, which often coalesce and then form a broken band on each separate segment. On this Rühl remarks (Soc. Ent. v. p. 106): "According to this description the larva is strongly separated from all *Melitæa* larvæ known to me, and Assmann would be right in making it a separate species." One cannot read this observation of Rühl's without some feeling of surprise, since, so far as one can judge from the description, the larva is quite of the usual type of the group, differing only in having more white in the ground colour, going in this respect apparently somewhat further than the larva of its nearest relative, *dictynna*, which shows more white than any other of the group with whose larva I am acquainted.

It does not appear to me to be worth while to quote the short descriptions of the larvæ of "*veronica*," *athalia*, and "*parthenie*" given by Dorfmeister in the 'Verhandlung des zool.-bot. Vereins,' iii. p. 136, since the first two might as well refer to one as to another of the group, and the third in which the spines are said to stand on pale flesh-coloured bases merely serves to show that he was quite unacquainted with the larva of *parthenie*, a fact which is made absolutely certain by his description of the corresponding pupa, which differs in every characteristic from that of real *parthenie*.

It is a matter of great regret to me that I have so far been unable to obtain any information on the early stages of *varia*, but of the only two friends from whom I should have been likely to obtain reliable information on the subject, the one, Chanoine Favre, died some time ago, and the other, his collaborator, M. Arnold Wullschlegel, has now for many months been completely paralysed, a fact which many English collectors in the Rhone Valley will, I am sure, learn with the greatest regret.

The name of M. Wullschlegel reminds me of a rather absurd discussion which took place some few years back as to whether the larva of *athalia* hybernates gregariously. Knowing how frequently he had bred the species, I inquired as to his experience, and he informed me that they invariably hybernated in a common "tent" like the other Melitæas, remaining together after hybernation until they had eaten the plant at the roots of which (of course not underground) they had passed the winter, and then separating. I had only asked him the question in confirmation of my own experience, having found many "nests" of *athalia* larvæ at the early period of their hybernation.

Buckler describes the pupa of *athalia* as follows :—" Half an inch in length, very plump, with the usual angles much rounded off ; the abdominal rings bear little rounded eminences—traces of the larval spines ; the tip of the abdomen is bent back at nearly a right angle, and there is a slight depression between the abdomen and thorax, which is broad and rounded. The wing-covers are well defined and rather prominent, the warmish white colour and texture of the pupa-skin may be compared to that of biscuit china ; each abdominal ring is adorned with a transverse brownish orange bar, having on its hinder edge squarish black spots, or sometimes a black bar with orange spots, and followed by a row of tiny black dots. The back of the thorax is marked with triangular streaks of black outlined with orange; the antenna-cases and wing-nervures are faintly marked with orange-brown, and the wing-covers and eye- and leg-pieces with strong black blotches and dashes."

All the above remarks, so far as shape, general appearance, and so forth are concerned, refer equally to the pupa of other members of the group.

The following notes have been made from pupæ bred by myself:—

Aurelia.—Pupa: General appearance very pale blue-grey, with transverse lines of orange, and black dots. Wing-cases darker blue-grey, with a row of very short black lines at the edge, interrupted below the middle and at lower end. Poulton's line distinctly visible. Under a lens the ground colour is seen to be white slightly tinged with blue, with fine black reticulations. Spiracles black, surrounded by white, patched with orange-brown. Anal segments recurved; tendency to pupate suspended (not universal).

Parthenie.—The pupa is very like *aurelia*, but darker, and has the border of black dashes on the wing-cases uninterrupted. The tendency is to pupate under the leaves.

With regard to the distinction in the markings on the wing-cases of *aurelia* and *parthenie*, it is, I think, reliable. When Mr. Sloper and I were breeding these two species from larvæ which we had found, he kept the two species in separate cages; some of mine were also kept separate, but some were intentionally mixed together. When we carefully examined his pupæ this was the most noticeable distinction, and by this I separated my pupæ, which in every instance bred true. As these larvæ only represented one locality for each of the species (Sion and Charpigny respectively), the distinction *may* not be of universal application, but it seems likely to be constant, judging by this test.

Var. *berisalensis.* — Pupa: General appearance dull dark bluish grey with orange tubercles; wing-cases dark mottled brown, except when too dark to show markings. Under lens: No blue colour as in the other two species (*aurelia* and *parthenie*), but intersegmental bands of slate-colour, with white and slightly pinkish spots; orange humps in the positions of the larval spines arranged on black and white spotted transverse bands; wing-cases of white ground colour, but almost (sometimes entirely) covered with brown markings; anal end recurved, with two scarlet humps (sometimes dull); humps on thoracic segments white tipped with orange; the pupæ vary considerably in amount of slate-colour, black and white; also in depth of wing-markings, sometimes having a reddish tinge, sometimes being almost jet-black. The pupæ are only very slightly suspended.

Mr. Powell's description of *deione*, which was made from a single specimen, corresponds in colour and markings with some of my specimens of *berisalensis*. He adds the following measurements: Total length of pupa under observation, 11·5 mm.; from anterior extremity to apices of wing-cases, 8·3 mm. Depth of thorax, 3·5 mm.; of third abdominal segment, 4·55 mm. Width of thorax, 3·9 mm.; of third abdominal segment, 3·8 mm.

The following are my notes on a pupa of *dictynna* which I bred: Ground colour whitish, with black interrupted transverse bars with orange humps, the central hump being in advance of the others; posterior segments black; fifth white segment, counting from the black segments, bears a diamond-shaped black patch; wing-cases white with broad black markings, but no row of black dashes at the margin; spiracles black in yellow rings; antenna-cases black.

Assmann describes the pupa of *britomartis* as follows: White, with small rust-yellow warts and pale- or black-brown spots and dots between them and in the intersegmental spaces. The wing-cases are of the same pale or dark brown colour, with the exception of two rows of lunules, a spot in the disc, another in the middle of the outer margin, and the fine nervures.

It may be worth while to give Dorfmeister's account of the pupa which he wrongly ascribes to *parthenie*, as it might lead to the identification of the species to which he assigned this name. It is as follows: Pearl-coloured, mostly shining, with black markings, back of the abdomen smooth, without raised points, and without yellow spots.

(To be continued.)

THE NUMBER OF LARVAL STAGES OF *LYCÆNA ACIS.*

By F. W. Frohawk, M.B.O.U., F.E.S.

To bear out my previous statements in the 'Entomologist' for November (vol. xliii. p. 305), I should like to add the following notes which I have copied from those accompanying each drawing I made, showing the different stages of the larva of *acis*. These may be of some interest to Dr. Chapman, and I trust he will consider them sufficient to show that I am correct in saying the larvæ under my observation passed through five distinct moults; but I feel sure, if he saw the drawings, he would be still further convinced that I am not in error.

I can only repeat my previous statement that the appearance of the cast skin beside the particular isolated individual after each moult must be taken as adequate proof that the particular larva, so kept under critical observation, moulted at the time.

Of course, as Dr. Chapman remarks, the enlargement of the head after a moult is indicative of another stage.

Notes accompanying the drawings as follow:—

Fig. 4. Segment directly after emergence; drawn July 15th, 1907.

Fig. 5. Shortly before *first* moult; drawn July 23rd, 1907.

Fig. 6 *a*, *b*. Before *second* moult (*a*, after first moult); drawn July 31st, 1907.

Fig. 7. Before *third* moult; drawn August 6th, 1907.

Fig. 8. Hybernating (after second moult); drawn Jan. 21st, 1908. Entered into hybernation about August 10th, 1907.

Fig. 9. Fixed for *third* moult; drawn April 11th, 1908. This one left its hybernaculum March 20th, and has since been feeding on furze-blossoms twenty-two days after hybernation; 239 days old.

Fig. 10. After *third* moult, 245 days old, moulted third time April 8th, 1908; drawn April 17th, 1908.

Fig. 11. After *fourth* moult and fixed for fifth moult, about 260 days old; drawn May 2nd, 1908.

Fig. 12. Fully grown, after *fifth* moult, about 275 days old; drawn May 19th, 1908.

Figs. 9, 10, and 11 are different individuals, but each kept separate for observation with full data.

AN AUTUMN MORNING IN THE ALLEGHANY MOUNTAINS.

By Margaret E. Fountaine, F.E.S.

The morning mists are thick and heavy in the valleys through which the Jackson River flows on towards the big Atlantic Ocean far away; but these misty mornings are almost invariably the forerunner of a glorious autumn day. And it is good to climb up the creeks and amongst the lower spurs of the Alleghany Mountains, notwithstanding that there is almost "nothing doing" here now amongst the butterflies, for the fall is fast coming on, and the green leaves are rapidly turning red and gold, as the sunset of the year approaches; and the butterflies, too, for the most part, are of sunset colours—the deep golden *Terias nicippe* being one of the commonest to be met with, perhaps only to be outnumbered by *Colias philodice*, more especially if in the neighbourhood of some strip of clover-land. Two species of *Grapta* are still worth netting—*G. interrogationis* (I always regret its name!) being a very fine species, with its pale blue borders to its wings, and *G. comma* (a very close ally I should think of our *G. c-album*) are sometimes well in evidence, though very wary and difficult to catch. But what we are most looking out for is the dark apparition of the iridescent *Papilio philenor* fluttering in ecstasy over some thistle-head, and probably quite freshly emerged, though *P. troilus* is already almost vanished altogether, only perhaps some shattered female seeking spice-wood whereon to deposit her eggs is to be seen. The larvæ of this fine *Papilio* are to be found, after much searching, coiled up in the leaves of the spice-wood bushes, though far from abundant, and now getting more and more scarce, most of them being already in pupa for the winter. *Papilio ajax* is still to be seen, though rarely, and sometimes a freshly-emerged specimen, very darkly coloured, will fall a victim to my net; the papaw bushes (*Asimina triloba*) have fed numbers of *ajax* larvæ, but all these are in pupa now for the winter, only an occasional straggler being tempted to emerge to enjoy the warmth and sunshine of these short autumn days, instead of waiting in patience till the spring. *Danais plexippus* is to be seen everywhere; these huge butterflies fly plentifully even in the streets of the little town of Covington, an abundant brood having only just recently sprung upon us. Sometimes we are reminded of our friends across the water by the sudden joy of beholding *Vanessa antiopa* sail majestically by, and then the glorious scenery of the Alleghanies grows dim, and our eyes and our thoughts are dreaming of autumn forests in Central Europe, where this lovely insect is no doubt now still on the wing, and indeed probably much more abundant than here, where it is decidedly scarce. *V. atalanta* is also here, just as gay and gladsome as it ever is over there in the Old World, and presenting, as far as I can see, no variation whatever. *V. huntera*, too, was here a fortnight ago, but they are gone now; though worn specimens of *Euptoieta claudia* are still to be met with, and even *Argynnis cybele* is not absolutely vanished, and females in shocking condition are still fluttering about looking for violet leaves to lay their eggs on, the habits of the larvæ being exactly similar to those of our closely allied fritillaries. *Limenitis astyanax* is over now, and their larvæ are preparing to go into hybernation on the wild cherry and other woodland trees. Only once did we take a specimen of *L. disippus*, and then it so closely resembled its model, *Danais plexippus*, that it was caught under the impression that it *was* that species; this specimen laid nine ova, but though they all hatched out, they refused to feed on the leaves of the wild cherry, whereon a young *astyanax* larva was flourishing, and therefore all died. *Phyciodes tharos* may still be seen in woodland districts, and *Hesperia montivaga*, old and faded now, about completes all we have, or can hope to have, during this autumn ramble in the Alleghany Mountains.

Covington, Virginia: October 1st, 1910.

PRELIMINARY LIST OF APHIDIDÆ FOUND IN KENT.

By Fred V. Theobald, M.A., &c.

Little seems to be known of the Aphididæ found in Kent. The records are very few and yet the species undoubtedly very numerous. During the last fifteen years specimens have been collected or observed in different parts of the county. Many of these have not yet been identified. Careful collecting would probably reveal a very large number more, many new to Britain, and probably some new to science. Eighty species are shown here to have occurred in the county, and thirty remain unidentified.

These insects are of great economic importance and deserve more attention. At present we know but very little of their life-cycles, their varied migrations, or of the numerous subterranean forms. When one considers the enormous loss caused by these insects it is strange that they are so neglected. Probably this is for two reasons—first, that they are most difficult to get named, and, secondly, their bionomics are so abstruse that one dare not call any form a species.

Where such well-known aphides as we find in orchards on pear, apple, currants, &c., come from or go to we cannot say. A sudden "blight" attacks currants, and as suddenly, later on, leaves the currants. Where do they go to? what is their other host-plant? Probably we shall find that most of the Aphididæ have two host-plants, just as we see in the hop aphis, the elm leaf-curling aphis, the mealy plum aphis, and others.

The following is merely a preliminary list of the aphides I have found in Kent, and it is hoped a second will be complete in another few years.

One reason I record these insects is because in a brochure I have recently bought in Berlin on the 'Insects of Kent'—a paged proof of some 'County History'—no mention is made of the Aphididæ. In the same county list one also notices that some of the most abundant insects, and some which annually cause thousands of pounds of loss are not even mentioned, such as the apple-sucker (*Psylla mali*) or the apple-blossom weevil (*Anthonomus pomorum*), and others of great economic importance.

APHIDINÆ.*

Genus Siphonophora, Koch.

Siphonophora rosæ, Réaumur.—Common generally over the county, judging from the wide localities it has been seen in or sent from. This species is a migrant to and from the teazle; at least I can detect no difference between the two insects.

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* I have followed here the nomenclature used by Buckton, as his is the only British work we have to refer to, but I do so with some hesitation.

S. granaria, Kirby.—Found all over the corn districts and elsewhere. I have never known any serious damage caused by it to corn in this county. Found on meadow foxtail grass at Wye. The green apple aphis (*Aphis fitchii*) placed in a cage with corn and grasses became winged and went to the latter. The progeny seemed to me the same as *S. granaria*. It is probable that these are merely dimorphic forms.

S. chelidonii, Kaltenbach.—Wye, July, 1901, 1904, on raspberry and on celandine in May in 1904; Crundale, on celandine, in May, 1909.

S. fragariæ, Koch.—Wye, July, 1905, 1906; Swanley, 1902; Sevenoaks. On wild and cultivated strawberries.

S. millefolii, Fabricius.—Wye, August and September, 1910; thickly coating the stems of the common yarrow (*Achillea millifolium*).

S. circumflexa, Buckton.—Wye, December to May, under glass; Swanley, June; Sellinge, July; Canterbury, May. On geraniums, arums, and other plants in greenhouses.

S. diroda, Walker.—Wye, June, July, August, on roses and on wheat and barley; Tonbridge; Ash; Canterbury. I feel sure there is a migration between the rose and *Graminaceæ* of this species. Generally common on roses.

S. pisi, Kaltenbach.—Wye, abundant always, very harmful in some seasons, notably 1908, to field and garden peas; Dover, 1904; Appledore, 1901; Tenterden, 1899.

S. pelargonii, Kaltenbach.—Wye, Sellinge, Ashford, Linton, on geraniums and calceolarias in the open and under glass.

S. lactucæ, Kaltenbach.—I have seen this in most gardens I have visited in the county, and think the same species occurs on red currants.

S. rubi, Kaltenbach.—Wye, Dartford, Tonbridge, Sellinge, Westwell, on the raspberry and also on bramble in May and June; it occurs on the raspberries later. Curls the leaves of the latter, but never does much harm.

S. urticæ, Kaltenbach.—Wye, Westwell, Ashford, Whitstable, Tunbridge Wells. Often very common on nettle.

S. carnosa, Buckton.—Wye, 1900, on stinging-nettles.

S. avellanæ, Schr.—Common all over the county where nuts are cultivated, and may be found on wild hazels. It often swarms on cobs and filberts, but seems to do little harm.

S. rosarum, Walker.—Common on wild and cultivated roses. I have found it in most localities where looked for.

S. sonchii, Linnæus.—Wye, Hastingleigh, on *Sonchus* and *Centaurea nigra* in 1902; heads of the latter smothered by it.

S. fragariella, Theobald.—Swanley, 1905, on strawberries under glass.

Genus PHORODON, Passerini.

Phorodon humuli, Schrank.—The common hop aphis, found in all hop-gardens in Kent, and also on sloe, damson, bullace, and plums. Migrates between the hops and prunes. Frequently causes endless loss to hop-growers and much expense in washing every year.

Genus Myzus, Passerini.

Myzus cerasi, Fabricius.—Widely distributed over the county. Sometimes does considerable harm to cherries.

M. persicæ, Sulzer.—Wye, 1901 and 1907, on peaches and nectarines, not seen since.

M. ribis, Linnæus.—Common all over the county on red currants and on gooseberries. Often very harmful.

Genus Rhopalosiphum, Koch.

Rhopalosiphum ribis, Linn.—Common on red and black currants, but mostly on the former in all parts of the county, June and July. I do not think that the red blisters on the leaves are caused by this aphis at all.

R. lactucæ, Kaltenbach.—Paddock Wood, Wye, Sellinge, Linton, Swanley, Sevenoaks, Dover, Ash. This species occurs on sow-thistle and lettuce, and appears to be the same as the former species.

R. nymphææ, Linnæus.—I saw this on some yellow water-lilies on the military canal near Hythe in 1899, but have failed to find it since.

R. ligustri Kaltenbach.—Wye, August, 1901 and 1905, and Chilham, 1904, on privet in small numbers.

R. dianthi, Schrank?—I am not sure of the species, but it is apparently the common turnip aphis, and has occurred all over the county.

Genus Melanoxanthus, Buckton.

Melanoxanthus salicis, Linnæus.—This large and beautiful aphis I have found in abundance at Wye in osier-beds, where it does considerable damage some years, often occurring in enormous colonies.

Genus Siphocoryne, Passerini.

Siphocoryne capreæ, Fabricius.—Wye, June and July, 1901 to 1907, abundant on various *Salix*, most so on the goat willow; Chilham, 1900; Woodchurch, 1899.

Genus Aphis, Linnæus.

Aphis brassicæ, Linnæus.—Scattered all over the county, appearing mostly in late July and August, and often doing much harm.

A. cratægi, Kaltenbach.—Wye, Chilham, Whitstable, Canterbury, Linton, Dartford, Tonbridge, Sellinge, often abundant on the hawthorn hedges.

A. carotæ, Koch.—Wye, Paddock Wood, Canterbury, Horsmonden. On the roots and leaves of carrots. Walker's *A. subterranea* is evidently the same.

A. grossulariæ, Kaltenbach.—Maidstone, Wye, Sellinge, Faversham, Swanley, Orpington, Canterbury. Common on gooseberries and red currants, doing much harm.

A. mali, Fabricius.—A common pest in all Kent orchards.

A. fitchii, Sanderson.—Wye, Orpington, Swanley, Linton, Dartford, Newington, Sellinge, Hythe, &c. Common on apple; probably occurs everywhere.

A. pyraria, Kaltenbach.—Wye, very common and harmful in my garden.

A. cucurbiti, Buckton.—Wye, on marrows in August, 1910.

A. sorbi, Kaltenbach. — Common in most districts, but especially so in the Marden area on apples, where it does much harm. Also on hawthorn. The red blistered and rolled leaves are most marked.

A. pruni Réaumur.—Common all over the county and often doing much harm to plums. I am almost certain this species also migrates to the hop.

A. hederæ, Kaltenbach.—Occurs annually on ivy in my garden at Wye from July to September, and then disappears as a winged brood, first seen, 1901; Blackheath, June, 1906.

A. rumicis, Linnæus.—On docks and thistles all over the county. It is undoubtedly one form of the destructive bean aphis or black fly, *A. fabæ*, Kirby & Spence.

A. atriplicis, Linnæus.—Wye and Stour Valley in 1904. It occurred in vast swarms in July, and settled on hops, leeks, onions, beet, wild chenopodia, mangolds, cabbage, dahlias, &c., coating the leaves with masses of winged females, which at once produced living young. Soon after a fungoid disease swept them all off, but not before great damage was done. I have not seen the species since.

A. papaveris, Fabricius.—Wye, June and July. I have found this twice in my garden. One of the two dull olive-green aphides found in July, August, and September on asparagus is clearly the same.

A. sambuci, Linnæus.—Swanley, 1904, swarming on elder trees.

A. cardui, Linnæus.—Wye, Crundale, Sellinge, in August, on thistles.

A. sambucaria, Passerini.—Wye, 1900, 1901, 1907; Swanley, 1905. June and July, and then disappears. Forms dense black masses on the top shoots of the elder trees.

A. circumflexa, Buckton.—Lee, June, 1906, on salvias.

A. pyri, Boyer de Fonscolombe.—Wye, July, 1908; curling the leaves of pears and changing them to pale yellow or pale rich red.

Genus HYALOPTERUS, Koch.

Hyalopterus pruni, Fabricius.—Wye and district, Linton, Dartford. Probably all over the county. Undoubtedly the same as *H. arundinis*, Fabricius. I have followed the leaving of the latter from reeds (*Juncus*) and rushes (*Arundo*) to the plums. Mr. Willcocks tells me the same happens in Cairo. Quite harmful to plums in Worcester and Herefordshire and at Wye in 1903 and 1905.

Genus CAITOPHORUS, Koch.

Caitophorus aceris, Linnæus.—Wye, 1905 to present year, in abundance on sycamore in all stages. Seems to do but little harm even when swarming beneath the leaves.

Genus PTEROCOMMA, Buckton.

Pterocomma pilosa, Buckton.—Wye, with *Melanoxanthus salicis* in small numbers; Eynsford, 1898, on weeping willows; Canterbury, 1897, &c.

Genus CALLIPTERUS, Koch.

Callipterus coryli, Goetze.—Wye, Linton, June to October, on hazel and on cultivated cob and filbert nuts.

Genus PTEROCALLIS, Passerini.

Pterocallis juglandicola, Kaltenbach.—Wye, on walnuts, in 1894. Not seen since.

P. tiliæ, Linnæus.—Wye, Ashford, Canterbury, Tunbridge Wells, Ramsgate. Frequently in enormous numbers on limes.

Genus PSYLLAPHIS, Koch.

Psyllaphis fagi, Linnæus.—Wye, Kennington, Canterbury, Linton, on copper beech and common beech; sometimes harmful.

Genus PTYCHODES, Buckton.

Ptychodes juglandis, Finch.—Wye, in 1897, 1901, and 1907, on the upper surface of walnut leaves in swarms, but doing no apparent damage. One colony found in August, 1910.

Genus LACHNUS, Illiger.

Lachnus pinicolus, Kaltenbach.—Kennington, in 1904, East Peckham, on Scotch fir, 1906, July.

L. viminalis, Boyer de Fonscolombe.—Wye, in profusion in my garden and along railway on various *Salix* in 1904; some colonies eight inches long.

L. piceæ, Walker.—Wye, Kennington, 1901 and 1906, both years in July, and after August 7th in 1901, and August 20th, 1906, they all disappeared. On the silver fir and the spruce.

Genus TRAMA, Heyden.

Trama troglodytes, Heyden.—Wye, on the roots of sow-thistle and on lettuce, often common.

SCHIZONEURINÆ.

Genus SCHIZONEURA, Hartig.

Schizoneura lanigera, Hausman.—All over the county on apple, both root and stem forms occurring and doing much harm. Occasionally found on the pear and on wild crabs.

S. fuliginosa, Buckton.—Wye, in Olantigh Gardens, in 1908, in numbers on *Pinus sylvestris* from June to September. Not seen since.

S. ulmi, Linnæus.—Wye, Canterbury, Bearstead, Maidstone, Ashford, on elms.

S. fodiens, Buckton.—Wye, Bearstead, Swanley, Canterbury, Tenterden, Paddock Wood, Faversham, Maidstone, Longfield (1908). Common on currant roots. Buckton's *S. fodiens* on currant roots is one form of the leaf-curling elm *Schizoneura* mentioned above.

S. lanuginosa, Hartig.—Wye, Chartham, Ulcombe, Swanley, Ashford, Hothfield, Dartford, Canterbury, Petham. The large galls they form are often very abundant on the elms.

PEMPHIGINÆ.

Genus Pemphigus, Hartig.

Pemphigus bursarius, Hartig.—Wye, Ulcombe, Ashford, Sittingbourne, on poplars. The galls are often very numerous.

P. spirothecæ, Koch.—Wye, 1901, 1907 to 1910, on poplars.

P. lactuarius, Passerini.—Wye, Paddock Wood, on roots of weeds and lettuce.

Genus Tetraneura, Hartig.

Tetraneura ulmi, De Geer.—Old Romney, 1879 (Buckton); Bearstead, 1905; Wye, 1901 to 1910; very abundant and doing much harm to young elms, many killed by it. Some galls reached over one inch in length.

CHERMESINÆ.

Genus Chermes, Linnæus.

Chermes corticalis, Kaltenbach.—Wye, on Scotch fir; Chartham and Hothfield.

C. abietis, Linnæus.—Common all over the county on spruce.

C. laricis, Hartig.—This form of the former is generally common on larch all over the county.

C. pini, Koch.—Wye, on *Pinus sylvestris*; Hothfield, 1900.

C. strobilobius.—Wye, common on spruce; Hothfield; Milton Chapel; Sevenoaks; Tonbridge; Appledore.

Genus Phylloxera, Boyer de Fonscolombe.

Phylloxera quercus, Boyer de Fonscolombe.—Bearstead, 1906, smothering a small oak near railway station; Hastingleigh, on two small oaks, evidently very destructive; Wye, on two young oaks in a plantation, both killed by them.

RHIZOBIINÆ.

Genus Forda, Heyden.

Forda formicaria, Heyden.—Beckenham (Lord Avebury in Buckton).

Genus Tychea, Passerini.

Tychea trivialis, Passerini.—Beckenham (from Buckton).

T. setulosa, Passerini.—Beckenham (Lord Avebury).

T. setariæ, Passerini.—Beckenham (Lord Avebury in Buckton).

T. eragrostidis, Buckton.—Beckenham (Lord Avebury in Buckton).

Genus Endeis, Koch.

Endeis pellucida, Buckton.—Beckenham (Lord Avebury in Buckton).

E. carnosa, Buckton.—Beckenham (Buckton).

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. Distant.

With vol. v. of my Rhynchotal portion of the 'Fauna of British India,' the Heteroptera, so far as that publication is concerned, must be considered as a completed subject. Fresh material, however, continues to reach my hands, and, as the Editor of this Magazine has offered me the hospitality of his pages, I propose from time to time to continue the description and enumeration of such species as have not previously been included in the fauna.

The Homoptera will be supplemented in another volume of the original work.

Fam. PENTATOMIDÆ.

Æliomorpha fletcheri, sp. n.

♂. Body and legs pale brownish-ochraceous; head punctate, the lateral margins strongly sinuate, central lobe prominent, depressed at apex; antennæ ochraceous, the second and third joints infuscate, first joint short, not reaching apex of head, second very short and subobsolete, third slightly longer than either fourth or fifth, which are subequal in length; pronotum granulose, more distinctly so on basal half, a central narrow levigate line, the lateral margins sinuate, the lateral angles subprominent and broadly subacute; scutellum more or less wrinkled and finely punctate, a small pale levigate spot near each basal angle; corium thickly finely punctate, inner margin at apical area of scutellum narrowly blackish; membrane hyaline, distinctly passing abdominal apex; connexivum ochraceous with large segmental brownish spots; lateral areas of sternum and abdomen beneath thickly punctate; rostrum reaching posterior coxæ, its apex black. Long. 4 millim.

Hab. Ceylon; Hambantota (Bainbrigge Fletcher—Brit. Mus.).

This is the second species of the genus at present described from British India.

Halyomorpha illuminata, sp. n.

Ochraceous, more or less punctured with olivaceous-green or fuscous; head thickly olivaceously punctate, the margins moderately reflexed, the apex subtruncate, lateral lobes very slightly longer than the central lobe; antennæ blackish, basal joint ochraceous with an outer black line, first joint almost but not quite reaching apex of head, second shorter than third, third and fourth subequal in length, fifth a little longest with the base ochraceous; pronotum ochraceous, thickly olivaceously punctate, excepting a discal transverse ochraceous area between but not reaching the lateral angles, this area is almost impunctate, but usually contains two maculate clusters of dark punctures, extreme margins narrowly ochraceous, lateral angles subprominent and broadly subangulate, lateral margins slightly reflexed; scutellum thickly darkly punctate, a levigate ochraceous spot at each basal angle, the apex stramineous with concolorous punctures; corium thickly but more finely darkly punctate; membrane passing the abdominal apex, pale fuliginous but reflecting the dark abdomen beneath; body beneath and legs pale ochraceous; two spots on each side of pro- and mesosterna, one on each side of metasternum, abdominal spiracles and elongate spots on lateral margins, spots on apical areas of femora, apical third of anterior tibiæ, and apices of tarsi, black. Long. 14 millim. Exp. pronot. angl. 8 millim.

Hab. Travancore (G. S. Imray—Brit. Mus.).

Scylax porrectus, Dist., Trans. Ent. Soc. Lond. 1887, p. 345, pl. xii. f. 7; *id.*, Faun. Brit. Ind. Rhynch. i. p. 161, f. 97 (1902).

Since describing and figuring this species I have received, by the kindness of Dr. Montandon, a male specimen from Kurseong, Bengal.

♂. Smaller than female, the lateral lobes of the head somewhat widely separated before the apex of the central lobe as in the female; anal segment in male somewhat longly produced, on each side in a robust curved spine, these spines are laterally very broad, and are provided beneath, near base, with a small tooth [projecting inwardly.

This effectually disposes of the contention of Breddin (Wien. Ent. Zeit. xxvi. p. 93 (1907)), repeated by Kirkaldy (Cat. Hem. (Heteropt.) i. p. 371, 1909), that *S. porrectus*, Dist., and *S. macrinus*, Dist., were the sexes of one species. As both these species were figured (Trans. Ent. Soc. Lond. 1887, pl. xii. figs. 7 and 9), where they can both be seen to be female specimens, the suggestion always appeared to me to be bizarre, but until I received the male of *porrectus* the refutation could therefore well be deferred.

Compastes taurus, sp. n.

Body above castaneous-brown; apex of scutellum, body beneath, and legs ochraceous; head coarsely darkly punctate, the lateral lobes divergent at their apices, lateral margins slightly sinuate, apex broadly rounded; antennæ with the first and second joints ochraceous, mottled with brownish, third black, ochraceous at base (remainder mutilated in type), first joint not reaching apex of head, second slightly shorter than third; pronotum coarsely darkly punctate, the lateral angles broad, short, a little directed upwardly and forwardly, their apices trisinuate, the anterior and posterior angles subacute, the lateral pronotal margins sparingly dentate, an obscure central pale levigate line, and between the lateral angles transversely subrugulose; scutellum more finely punctate and transversely wrinkled, the basal area moderately elevated; corium thickly, somewhat finely punctate; membrane bronzy brown, a little passing the abdominal apex, an obscure ochraceous spot at the outer basal angle; sternum blackly punctate, orificial areas broadly blackish; abdomen beneath finely mottled with pale brownish, spiracles and linear marginal spots black; legs finely mottled with brownish; rostrum reaching the posterior coxæ, its apex black; mesosternum centrally sulcate. Long. ♀ 17 mm. Exp. pronot. angl. 11 millim.

Hab. Bengal; Kurseong.

The comparatively short, apically tricarinate lateral angles of the pronotum will distinguish this species. I received it through Dr. Montandon.

Prionaca nigrescens, sp. n.

Black, more or less mottled with ochraceous; head punctate, transversely wrinkled, with fine more or less distinct longitudinal carinate lines, the most prominent at the middle of the central lobe, the apex rounded, the lateral lobes very slightly longer than the central lobe and cleft at their apices; antennæ black, first joint not reaching apex of head, second longest, third and fourth subequal, the latter ochraceous at base; pronotum coarsely punctate and rugulose with scattered ochraceous mottlings, a central ochraceous line not reaching base, on each side of which is a levigate ochraceous spot, lateral angles robust, somewhat strongly, laterally, and a little upwardly produced, their apices shortly acute, their margins serrate, lateral pronotal margins shortly obtusely dentate; scutellum thickly punctate, three levigate ochraceous spots at base, one at each basal angle and the third central, the lateral and apical margins very narrowly and obscurely dull ochraceous; corium thickly punctate, a somewhat large irregular impunctate ochraceous spot a little behind middle of disk; membrane pale bronzy brown; connexivum pale testaceous, spotted with black; sternum black, greyishly tomentose, finely punctate; abdomen dull ochraceous, the spiracles and lateral marginal spots black; coxæ and femora ochraceous, apical areas of femora, and the whole of the tibiæ and tarsi, black; rostrum just reaching the posterior coxæ, its apex black; abdominal spine not extending beyond the posterior coxæ; sternum distinctly centrally sulcate. Long. ♂ 9½, ♀ 10½ millim. Exp. pronot. angl. ♂ 7, ♀ 8 millim.

Hab. Bengal; Kurseong.

For the possession of this species I have to thank my friend Dr. Montandon.

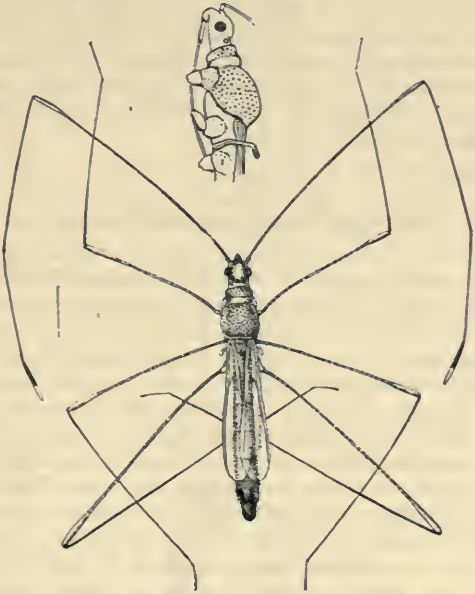
Fam. BERYTIDÆ.

Genus Taprobanus, nov.

Body long and narrow; posterior femora passing apex of abdomen; hemelytra shorter than abdomen; head longer than broad, deflected and narrowed anteriorly, moderately globose; ocelli at a short distance from base, nearer lateral margins than to each other; eyes about midway between base and apex; antennæ with the first joint longest, a little shorter than the body, its apex slightly incrassated, second a little longer than third, fourth short and moderately incrassated; pronotum about one and a half times as long as head, distinctly transversely impressed and narrowed at about one-third from anterior margin, remaining two-thirds moderately convex and distinctly declivous from base, the lateral margins a little rounded, basal margin truncate, anterior margin moderately convex; scutellum longer than broad; hemelytra extending to about the base of the penultimate abdominal segment; rostrum reaching the posterior coxæ, basal joint stoutest and reaching middle of head, legs long and slender, femora incrassated at apices, anterior legs with the tibiæ as long as femora, intermediate and posterior legs with the tibiæ distinctly longer than femora.

Taprobanus gravelyi, sp. n.

Shining ochraceous; apical joint of antennæ black, its apex white; head smooth, glabrous; eyes black; pronotum thickly coarsely punctate, the anterior area elevated, depressed interiorly, a little nodulose at middle of anterior margin, basal margin narrowly laminate; hemelytra pale ochraceous, the corium a little darker; femora finely spotted with black, the incrassated apices pale testaceous, tibiæ and tarsi fuscous. Long. 7 millim.



TAPROBANUS GRAVELYI.

Hab. Ceylon; Peradeniya (F. H. Gravely).

CAPYS MALACAIPUS (Faun. B. I. Rhynch. vol. iv. p. 490).

Capyella horni, Bredd. Deutsch. Ent. Zeitschr. 1907, p. 37.

NEW SPECIES OF HEMITHEINÆ (GEOMETRINÆ, Auctt.).

By Louis B. Prout.

Agathia dimota, Prout, nov. sp.

♀. 42 mm. Structure and coloration of *pisina*, Butl., &c.; abdomen not appreciably crested, dorsally red-brown, with quite indistinct pale spots. Fore wing with the red-brown markings arranged as follows:—basal patch obliquely bounded, broadening *costad*; median band consisting of three large, well-separated spots, the middle (between M^1 and M^2) elongate distad, and scarcely entering the cell, hence appearing more out of alignment than in the other known forms, the inner-marginal spot trilobed, a rounded lobe standing between SM^2 and the fold, a rounded (proximal) and a smaller, less regular (distal) one between SM^2 and inner margin; sub-apical band consisting of an irregular blotch from the costal shade to R^2, and a second one from R^3, joining the terminal shade below M^1; terminal shade irregular in width, narrowing to a fine line about R^1, forming two rather large triangles on R^2 and R^3, and extending rather broadly along inner margin to a distance of about 4 mm. from tornus. Hind wing with the red-brown markings normally formed. Under side with the markings similar, but somewhat weaker and reduced in extent.

Fiji. Type in coll. L. B. Prout.

Anisozyga vagilinea*, Prout, nov. sp.

♀. 40 mm. Face and occiput green; vertex white. Palpus rather slender, less long than in typical *Anisozyga*, hardly over 1½, green, beneath white. Antenna on its dorsal (scaled) area white proximally, green distally. Thorax and abdomen green above, white beneath, abdomen with white anal end and white dorsal dots. Fore wing longer and narrower, and hind wing with costa longer than in typical *Anisozyga*. Colour rich deep bluish green, costa of fore wing pure white, lines yellow, very slender. Fore wing with antemedian line from costa near base to inner margin just beyond one-third, very oblique outwards, forming a tooth outwards in lower half of cell, broadly outcurved in submedian area, and again oblique outwards to inner margin; postmedian line from costa at three-fourths, dentate and zigzag, approaching termen at R^3 and M^1, and to a less extent at M^2, then running basad for some distance along that vein and sharply bent to run to inner margin at nearly three-fourths; termen with conspicuous pure white dots which extend into the fringe; fringe mostly dark grey, varied with reddish at tornus. Hind wing similar. Under side uniformly very pale green.

Fak-Fak, Dutch New Guinea, December, 1907 (A. E. Pratt). Type in coll. L. B. Prout.

Very close to *Anisozyga exililinea*, Warr., Nov. Zool. xiii. 89 (*Rhomborista*), differing in the possession of a white dot at the base of fore wing, in the quite different inner line of both wings (strongly outcurved in submedian area) and especially in the shorter palpus. Both species are aberrant in shape and in having DC^3 of the hind wing not very oblique.

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* *Anisozyga* (Turn., MS.), Prout, nov. nom.=*Anisogamia*, Warr., Nov. Zool. iii. 286, nec Saussure, 1893.

Rhomborista megaspilaria gibbosa, Prout, nov. subsp.

Like Guenée's type form except in the shape of the wings; fore wing with termen strongly bulged in middle, very oblique below, tornus sometimes considerably cut away; hind wing somewhat narrower than in the type.

Fak-Fak, Dutch New Guinea, 1700 ft., December, 1907. Type in coll. L. B. Prout.

Thalassodes eumixis, Prout, nov. sp.

♂. 40–43 mm. Extremely like *Th. albifusa*, Warr. Nov. Zool. iii. 293, of which I at first regarded it as a local race; but as I have learned that *albifusa* also occurs at Fak-Fak, I believe it will prove a separate species. Differs in its usually larger size* and restriction of the white markings; head nearly all green, only *very narrowly* white between the antennæ; antennal shaft with less white than in *albifusa*; wings with the white markings narrowed and a good deal dusted with green.

Fak-Fak, Dutch New Guinea, 1700 ft., December, 1907 (A. E. Pratt). Type and two other males in coll. L. B. Prout; others seen. Also from British New Guinea.

Thalassodes interalbata, Prout, nov. sp.

♂. 45 mm. Shape and structure normal, palpus with third joint quite moderate, hind tibia dilated with hair-pencil, termen of hind wing with elbow moderately pronounced. Face green; vertex and occiput white; palpus green, white beneath. Antenna ochreous, proximally white-scaled. Thorax and abdomen green above, white beneath. Fore leg ochreous, other legs whitish. Wings of the same green as *Th. albifusa*; fore wing with two broad white bands which are coarsely speckled with green in places, especially at their boundaries, hence rather ill-defined; the antemedian band from near base, reaching on costa to nearly one-fourth, on inner margin to nearly one-third; the postmedian occupying about one-half of the terminal third of wing, shading off into green (white-speckled) costally and distally; fringe concolorous with termen; no cell-spot. Hind wing with similar white bands; the first occupying the cell and approximately the inner-marginal one-third of wing, the margin itself narrowly green; second band continuing the postmedian of fore wing, running near the distal margin and terminating at R^3; fringe as in fore wing; no cell-spot. Under side similar, but much paler.

Fak-Fak, Dutch New Guinea, 1700 ft., January to February, 1908 (A. E. Pratt). Type in coll. L. B. Prout.

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* I have seen one undersized example, no larger than average *albifusa*.

Closely related to *Th. albifusa*, Warr., differing chiefly in the broader white bands and absence of discal spots.

Antharmostes (?) *lunatimargo*, Prout, nov. sp.

♂. 32 mm. Face reddish mixed with fuscous (abraded), vertex narrowly pale ochreous brown, occiput, palpus and shaft of antenna red-brown. Thorax and base of abdomen dorsally concolorous with wings, dorsum of abdomen otherwise reddish brown mixed with pale ochreous brown; thorax and abdomen beneath pale ochreous brown; fore leg mixed with reddish. Wings blue-green, without lines; fore wing with costal margin red-brown, coarsely and irregularly marked with fuscous, becoming pale ochreous brown against SC; both wings with the termen narrowly of the same red-brown colour, preceded by a thick, lunulate pale line, and this again by an extremely fine dark line; terminal line fine, dark; fringe pale ochreous slightly marked with reddish. Under side very pale, dirty greenish, the margins with suggestions of the ornamentation of upper surface.

Near Baringa, Lulongo River, Congo, long. 21° E. (Rev. E. Cartwright). Type in coll. L. B. Prout, kindly presented by Mr. G. R. Baldock, F.E.S. A female from Lagos, July 30th, 1906 (G. L. Boag), much smaller and in inferior condition, in coll. Brit. Mus.

Will almost certainly require separating generically from *Antharmostes*, in spite of superficial resemblance; palpus in both sexes more slender, in male shorter, in female with third joint elongate, exposed; fore wing with R^1 short-stalked with all five subcostals; hind wing with the angle at R^3 very slight, not produced into a tail; both wings with DC^3 very oblique below, as in *Agraptochlora*, &c.; female antenna pectinate.

Gelasma fuscifimbria, Prout, nov. sp.

♂. 44 mm. Face and palpus black, palpus light beneath; vertex and basal part of antennal shaft whitish, pectinations brownish grey, extreme back of head, with thorax dorsally, greenish grey (slightly discoloured), abdomen grey. Legs pale, fore leg fuscous-marked above. Wings glaucous grey, scarcely greenish, not iridescent. Fore wing with the lines pale, rather indistinct; antemedian slender, waved, from nearly one-fourth costa to one-third inner margin, very faintly dark-shaded distally; postmedian from nearly two-thirds costa to two-thirds inner margin, lunulate-dentate (the teeth pointing outwards on veins, the deepest lunule between M^2 and SM^2), very faintly dark-shaded proximally; an indistinct elongate, slightly curved, dark cell-mark; fringe concolorous distally, slightly darker proximally. Hind wing similar, without the antemedian line. Under side uniform dirty whitish, the fringes fuscous.

Khasis. Type in coll. L. B. Prout. Three females (somewhat smaller) in coll. Swinhoe.

Rather near *G. sublustris*, Warr., Nov. Zool. vi. 24, but larger and greyer, lines less clear white, discal marks dark, not whitish; also in structure, the third palpal joint is less long and slender than in the male of that species.

Seems to have been confounded with *glaucaria*, Walk., from which the larger size, somewhat darker colour, blackish palpus and dark fringe beneath readily distinguish it.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from vol. xliii. p. 349.)

Perizoma taiwana, sp. n.

Fore wings with a blackish basal patch and medial band, outer edge of the former and the inner of the latter white, space between patch and band ochreous brown clouded with darker brown; the black outer edge of medial band is slightly angled near costa, and bidentate at middle, followed by a narrow white band outwardly tinged with ochreous brown; the area beyond is brownish, with a large irrorated white spot between veins three and five, some black bars above the spot and some black scales below it; submarginal line formed of white dots, more or less connected towards the costa; fringes pale brown, marked with darker. Hind wings whitish, fuscous tinged.

Expanse, 26 millim.

Collection number, 824.

A female specimen from Arizan (7300 ft.), September 15th, 1906.

Perizoma simulata, sp. n.

♂. Fore wings whitish, flecked with pale brownish; basal patch and medial band blackish brown, the middle of the latter strongly bidentate; apical fourth of costa blackish; submarginal line represented by five white dots towards the costa, the fourth preceded by a blackish bar; a blackish discal mark; fringes chequered with blackish brown. Hind wings whitish, outer margin fuscous tinged. Under side of the fore wings fuscous, ochreous tinged; the markings of upper side faintly showing, the five submarginal spots clearly defined; of the hind wings pale fuscous, mottled with darker; a black discal spot, a whitish postmedial line, and a submarginal series of white dots.

Expanse, 19 millim.

Collection number, 827.

One male specimen from Arizan (7300 ft.), September 26th, 1906.

Allied to *P. decorata*, Moore, from Sikkim. Some specimens, also from Sikkim, in the British Museum Collection, seem to be identical with the Formosan insect now described.

Anisodes taiwana, sp. n.

♂. Whitish ochreous, irrorated with ochreous brown. Fore wings have four purplish transverse lines; the first line wavy, indistinct; the second line slightly angled and indistinct above the darker discoidal mark; the third line dentate, appearing to terminate in a purplish cloud about the middle of the wing; the fourth line slender, wavy, dotted with black; a purplish loop from fourth line, between veins five to six on the outer marginal area; black marginal dots at the ends of the veins. Hind wings have four lines somewhat similar to those of fore wings, but the first is even less distinct; outer margin dotted with black.

Expanse, 30 millim.

Collection number, 869.

A male specimen from Kanshirei (1000 ft.), April 28th, 1908.

Nearly allied to *A. heydena*, Swinhoe.

Callerinnys rufolimbata, sp. n.

Orange-yellow, sprinkled with brown scales; outer area of all wings, beyond the dark brown postmedial line, purplish brown, enclosing a patch of the ground colour. Fore wings have a black discal dot; antemedial line dark brown, curved, indented near costa and again towards inner margin; on the hind wings the antemedial line is angled near costa and at middle. Fringes orange-yellow, chequered with brown.

Expanse, ♂ 28 millim., ♀ 32 millim.

Collection number, 637.

A male specimen from Kanshirei (1000 ft.), August 20th, 1905, and a female from Suisha Taisar (3000–4000 ft. ?), July 13th, 1908.

There are two examples of this species from Ceylon and one from the Andamans in the British Museum.

Thyatira albipuncta, sp. n.

Head and thorax brown, collar and crest tipped with chestnut. Fore wings brown shaded with darker; a pinkish brown patch on basal fourth of costal area, enclosing a brown linear spot on the costa; a conspicuous white subbasal spot below the median nervure; stigmata slightly darker but not distinct; antemedial line blackish, wavy, indented below costa, inwardly edged with whitish; postmedial line black, double, enclosing a white thread, originating in a pinkish brown patch on the costa, outwardly edged with red from vein three to dorsum; three or four other wavy, dusky lines between the ante- and postmedial lines, all most distinct on the costa; subterminal line whitish, marked and interrupted with blackish, wavy; an oblique whitish cloud from apex to postmedial line; venation barred with chestnut on outer margin, each bar terminating in a black V on the margin. Hind wings dark fuscous.

Expanse, 40 millim.

Collection number, 917.

The type—a male from Formosa—is in the British Museum Collection. I have two specimens from Arizan (7000 ft.), taken in July, 1909.

Trisuloides subflava, sp. n.

♂. Head and collar white, the latter edged in front and spotted with black; thorax brownish mixed with white; abdomen yellowish towards base, remainder greyish, dorsal tufts blackish. Fore wings blackish grey, sprinkled with white and tinged with brown on the outer margin; a white patch at base enclosing short black basal and interrupted subbasal lines; a small white spot in the cell, and a larger one at end of cell, the latter enclosing a black grey mark, extends to postmedial line; antemedial line black, preceded by a black mark on the costa, deeply indented about middle and again before the inner margin; postmedial line black, sharply angled below costa, curved beyond cell, and obtusely angled before the inner margin; submarginal line black, irregularly serrate, followed by some small white spots; marginal line whitish, wavy. Hind wings yellow, outer margin narrowly brownish. Under side yellow, outer margin broadly dusky limited by blackish lines; fore wings have a blackish cloud at end of the cell, and a dusky shade below; hind wings have the median third whitish from the costa to vein three.

Expanse, 55 millim.

Collection number, 1769.

One male specimen from Rantaizan (7500 ft.), May 14th, 1909.

There are unnamed specimens from Omeishan, China, and Khasia, in the British Museum.

Deilemera albofasciata, sp. n.

♀. Head, thorax, and abdomen yellow marked with black, as in *D. arctata*, Walk. Fore wings blackish grey; a white longitudinal line from the base under median nervure, the outer end squared, a blackish dot on it near base; a white, oblique postmedial band, the inner edge indented deeply, between veins two and three, the outer edge dentate; a blackish grey mark on the band between veins five and six; white marginal spots at ends of the veins, the fourth and fifth larger, connected with postmedial band by white scales along veins three and four. Hind wings white, with eight black spots on outer margin, sixth and eighth largest; fringes white, marked with black between veins four and five.

Expanse, 54 millim.

The type—a female—from Kagi district (7000 ft.), Formosa, in the British Museum Collection.

Deilemera fractifascia, sp. n.

Head white, a black spot on crown; thorax white with ten black spots; abdomen white spotted with black on the anterior segments, and banded with black on the posterior segments. Fore wings greyish brown; a short white streak from base under median nervure, enclosing a spot of the ground colour near base; two white marks on the costa, one near base, the other at about one-fourth from base; a postmedial series of five white spots, the fourth much smaller than the others; a white dot just below origin of vein two, and another just above middle of the inner margin; an elongate white spot above the inner angle, and a white subapical dot. Hind wings white, a rather broad greyish brown border on outer margin, in which are two white spots—one at middle and the other towards costa.

Expanse, 52 millim.

Collection number, 1216.

One male specimen from Kanshirei (1000 ft.), May 2nd, 1908; another example of the same sex from Poppawnia, Suisha (3000–4000 ft. ?), July 14th, 1908.

(To be continued.)

NOTES BY THE WAY.

We all have a soft spot in our heart for that curious little book over which we spilt "treacle" years ago, 'The Butterfly Collector's Vade Mecum'; but how few of us know aught of the author! Recently we were delighted to stumble across a short notice of her under one of her poems in a somewhat rare book, 'The New Suffolk Garland,' compiled by John Glyde in 1866. It runs thus: "Lætitia Jermyn (1788–1848), second daughter of George Jermyn, at an early age evinced a taste for poetry and general literature, and her graceful writings appeared in many periodicals of the day. She was born at Ipswich, October 8, 1788, and was married in 1830 to the Rev. James Ford, Fellow of Trinity College, Oxon, and Vicar of Navestock, whose topographical and antiquarian researches she materially aided during an engagement of twenty years, and to whose well-stored mind he constantly referred in all his literary pursuits. Possessing unusual conversational powers and sparkling wit, combined with a lively manner and great personal attractions, she was an ornament to the society in which she moved. Her love of nature led her to the study of entomology. She published, in 1827, 'The Butterfly Collector's Vade Mecum,' dedicated to the Rev. William Kirby. She was a good botanist, and a knowledge of conchology also ranked among her many attainments. She died at the Vicarage, Navestock, after a short illness, July 15, 1848." The English is shaky, but concise.

One is set wondering what percentage of the books upon entomology never find notice in the periodical scientific literature of Britain by casually picking up in an hotel in Southwold last September an odd copy of 'The Athenæum,' and finding, under the head of "Science," reviews of two United States books upon ants. These are, 'Ant Communities and How they are

Governed,' by H. Christopher McCook, published by Harper Brothers, in which the learned doctor appears to regard the constitutional monarchy of the queen ant as susceptible to human laws and explanations as that of Portugal, though his personal observations, and especially those in the Alleghany Mountains, are of an unusually close nature. The other is 'Ants: their Structure, Development, and Behaviour,' by William Norton Wheeler, published by the Columbia University Press in New York; and here we have egotistical wisdom—such wisdom as would consign the knowledge of the Ven. William Kirby in the Seventh Bridgewater Treatise "to the theological dustbin" (they are well worth resuscitating), and refers to "scholastic writers, like the Jesuit Wasman," whom he accuses of allowing his views on instinct to be governed by a zeal to "save one of the old Thomistic dogmas." Both books are evidently worthy of perusal.

We hasten to congratulate Percy H. Grimshaw upon being entrusted by Messrs. Lovell, Reeve and Co. with the preparation of a work upon the British Diptera, upon the lines of Canon Fowler's 'Coleoptera of the British Isles' and others of the same series, to run to some five volumes. We are informed that the first volume will contain the Cecidomyidæ, Mycetophilidæ, Bibionidæ, Simuliidæ, Chironomidæ, &c., and that the author is anxious to amass at once material for the first family from all parts of the country—galls, larvæ, and imagines—since the distribution of these interesting gnats is an important feature. There certainly is room for a work of intermediate nature between the beautiful and ponderous tomes emanating all too slowly from the doyen of the Entomological Club, and the mere analytical tables of Rev. W. J. Wingate, published by Williams and Norgate in 1906, though most useful in their sphere. We also learn that Mr. H. J. Charbonnier, of Shepton Mallet, is preparing his collection of Diptera for generous presentation to the Taunton Museum.

The other day we picked up for a song another link with a bygone entomologist. This is the 'Bohemian Poems, Ancient and Modern,' of A. H. Wratislaw, M.A., Fellow and Tutor of Christ's College, Cambridge, well known to most corresponding lepidopterists fifty years ago, who wrote upon "Entomology in Suffolk" in the Trans. Suff. Archæolog. Soc. 1870, pp. 219–222, and "Reminiscences of Entomology in Suffolk" in E. M. M. 1880, p. 86, &c. This volume shows him in a new light to us; that he was Head of Bury St. Edmunds School we knew, but that he himself came of an old Bohemian family, of kindred race with the Count Valerian Krasinski, to whom the volume is dedicated, and attained such beauty of translated and original verse as is displayed in this book, published by J. W. Parker, West Strand, in 1849, we had no idea.

We have just been enjoying the very capital cinematographic *Dytiscus* and its larva, at the New Egyptian Hall, in Piccadilly. The record of each movement is thrilling; and we hope the idea may be extended to other orders of insects.

C. M.

NOTES AND OBSERVATIONS.

Unusual Pairing of Moths.—It may be of interest to record the capture in the Norfolk Broads, on August 12th last, of a male *N. brevilinea* paired with a female *L. impura.* The female laid a nice batch of ova in a reed stem, but unfortunately these failed to hatch.—R. Geoffrey Todd; The Limes, Hadley Green, Barnet, December 16th, 1910.

Syntomis rubicunda.—This African moth was originally described by Mabille in 1892 (Ann. Soc. Ent. France; Bull. p. cxxxix.), but was redescribed and figured by Mabille and Vuillot in 1895. Hampson, who examined the type, has treated it as a synonyn of *S. leucerythra*, Holland, 1893, being evidently aware only of the 1895 description. The object of this note is to point out that *rubicunda* was really published first, and is the valid name.—T. D. A. Cockerell.

Smerinthus ocellatus in the North Sea.—A friend has just handed me a specimen of *Smerinthus ocellatus* which alighted, on June 12th last, on a steamer in the North Sea, about one hundred and fifty miles south-west of Esberg in Denmark. My friend tells me that he kept it alive for two days on sugar and water, but it was evidently too exhausted to recover. This appears to me to be interesting as, so far as I know, the migratory instincts of this species have been but little recorded.—A. H. Jones; Shrublands, Eltham, December 9th, 1910.

CAPTURES AND FIELD REPORTS.

Macaria liturata var. nigrofulvata in North Lancashire.—I took a larva of this interesting variety from Scotch fir, in Low Wood, Holker, September 12th, 1909. The moth emerged in June, 1910, and is identical with Cheshire (Delamere Forest) specimens.—T. Baynes; 70, Sunderland Terrace, Ulverston, N. Lancashire.

Xylophasia zollikoferi in Britain, 1910.—I beg to record the capture of a male specimen of *X. zollikoferi* at Methley on August 12th, 1910. It was shaken out of a bunch of withered leaves. I sent it to G. T. Porritt, Esq., of Huddersfield, who has identified it for me. He also informs me that it is in better condition than the other three recorded British specimens he has seen.—John T. Wigin; Methley, Leeds, December 10th, 1910.

Unrecorded occurrences of Vanessa antiopa.—As it is always of interest to note the appearance of *V. antiopa* in this country, owing to the migratory habits of this species, I place on record two specimens (both of which I have lately added to my series of British caught examples) that were captured by a lady in her garden, one at Southchurch, Essex, in September, 1880, and the other in a conservatory in her garden at Rayleigh, Essex, in August, 1901. Also Mr. R. C. Banks informs me that on September 1st, 1909, while shooting with a friend near Abergavenny, Monmouthshire, they saw a fine specimen of this butterfly sunning itself on a gate post within two or three feet of them.—F. W. Frohawk; November, 1910.

Sirex gigas.—From time to time I see the capture of *Sirex gigas* recorded in this journal; it would seem, therefore, that the captors consider it a rare insect in this country. I should like to remark that in my experience I find it appears to be not only quite a common species, but very widely distributed, as I have during many years past received numbers for identification every year, from July to October, from various localities throughout the British Isles, and in many instances my correspondents remark on the number of specimens met with.—F. W. Frohawk; November, 1910.

Captures at Light in Isle of Wight. — *Pœcilocampa populi* and *Asteroscopus sphinx* (*cassinea*) are both common at lamps in the island, this month.—G. Nobbs; North Lodge, East Cowes, Isle of Wight, December, 1910.

Notes from Haslemere for 1910.—The first record in my notebook worthy of mention is under the date of March 25th, when a search of tree trunks and among the undergrowth of a copse yielded *Polyploca flavicornis*, *Xylocampa areola*, *Xylina ornithopus*, *Tæniocampa pulverulenta*, *Phigalia pedaria*, and *Tephrosia bistortata*. The lamps were visited with the usual results, the most noteworthy feature during the latter part of March and the first week of April being the great profusion of *Amphidasys strataria*. On several nights between April 21st and May 12th good results were obtained by searching for larvæ among the sallows, birches, hazels, alders and bilberry, the insects which emerged therefrom being:—*Noctua festiva*, June 12th, a nicely varied series; *Boarmia repandata*, June 12th, very fine; *N. brunnea*, June 15th; *Aplecta nebulosa*, June 18th *N. triangulum*, June 18th; *N. ditrapezium*, June 22nd, a very fine and varied lot, including one interesting variety, where the black markings are almost entirely absent, being merged in the ground colour of the wings; *Triphæna fimbria*, July 4th, in great variety; *N. baja*, July 7th; *T. ianthina*, July 7th; *T. comes*, July 15th, and sundry parasitic flies of different kinds. On April 27th I found a very fine female *Saturnia pavonia* sunning herself on the top of a tuft of heather, and I was successful in taking a good number of males by "assembling" with her. From May 10th onward *Euchloë cardamines* was unusually plentiful, and the ova were to be found in great numbers on garlic mustard; from May 14th *Cyaniris argiolus* was out in profusion, and the second brood appeared to be equally in evidence

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both in Hampshire and in Cornwall where I happened to be in August. On May 24th large numbers of *Callophrys rubi* were observed, and I obtained a few ova on the 27th which were deposited on young laburnum shoots. The resultant larvæ emerged on June 4th, and fed up very quickly on broom flowers (as far as I could see entirely refusing to eat any leaves), and the majority had pupated by July 5th. On June 3rd I took a fine female *Eustroma silaceata* at a lamp and she obliged with sixteen ova, all of which produced fine imagines. The young larvæ appeared on June 10th, began to pupate on July 3rd, and the imagines came out between July 21st and 27th. We had a series of stormy nights between June 5th and 9th with wind and thunder and lightning, but the lamps were swarming with moths all the time, including *Stauropus fagi*, *Drymonia trimacula*, *Notodonta trepida*, and other prominents, *Demas coryli*, *Xylophasia rurea*, with the variety *combusta*, *Dianthœcia carpophaga*, and a fine series of *Emmelesia albulata*, as well as swarms of common things. On June 10th a female *Parasemia plantaginis* was taken from long grass. She deposited twenty-seven ova, and the resultant larvæ fed up well on plantain, though a few died off at each moult. The first pupa appeared on September 15th and produced an imago on October 26th. All the survivors had pupated by October 9th, except one, which is still a small larva, and has curled up for the winter. Four imagines have appeared up to date, the last one on November 18th. On June 12th the lamps were swarming with moths, with *Dasychira pudibunda* and *Gonodontis bidentata* predominating; but *Drepana binaria*, *D. falcataria*, *Boarmia consortaria*, *Eupithecia oblongata*, *Chloroclystis rectangulata*, *Cidaria corylata*, and others were also taken. On June 22nd, which was a windy day, though the sun was shining brightly, a fine series of *Cœnonympha pamphilus* was netted, the females being especially large.

Sugar, on the whole, was disappointing throughout the season, but on June 27th *Acronycta megacephala* and *Hadena genistæ* were taken, and on July 5th a nice series of *Mania typica*. On July 8th, a dark, damp night, *Lithosia lurideola* was taken from a lamp, and on the 11th *Hygrochroa syringaria*, *Cidaria picata*, and *C. associata*, with *Acidalia virgularia* on the 12th. On the 13th a fine specimen of *Limenitis sibylla* was seen, but not captured, and an interesting example of protective resemblance observed in a pair of young nightjars, to a large stone on the ground. The mother was seen flying around in an agitated manner, so we knew we must be too near her young to please her; but it was a long time before they could be found. On July 16th a female *Augiades sylvanus* was seen ovipositing and a few ova were obtained as she left them. The larvæ therefrom came out on August 2nd, and went on feeding till about the end of October, when they retired into their tents for the winter. On July 20th *Acronycta leporina* was taken from a lamp. I was away from home during August, and the next entry in my diary is for September 5th when *Tapinostola fulva* was taken from a lamp—my first record for this insect in Haslemere. From September 17th to October 1st I spent a good deal of time beating the birches, and was rewarded with larvæ of *Pheosia dictæoides*, *Notodonta dromedarius*, *Lophopteryx camelina*, *Cymatophora fluctuosa*, *Acronycta* *leporina*, in fair numbers, as well as many *Hylophila prasinana*, *Drepana lacertinaria*, *Dasychira pudibunda*, *Phalera bucephala* and many geometers. On September 30th *Gortyna flavago* was taken at a lamp and deposited ova in the pill-box on the way home; and on October 27th a fair number of male *Pœcilocampa populi* were taken.

Thus it will be seen that during 1910 the lamps were unusually productive and the sugar very disappointing; and I regard the sallow searching in the spring and the beating of the birches in the autumn as my best work for the year.—F. A. Oldaker, M.A., F.E.S.; The Red House, Haslemere, November 22nd, 1910.

SOCIETIES.

Entomological Society of London. — *Wednesday, November 16th*, 1910.—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—It was announced that the Council had nominated the following Fellows to act as officers for 1911:—President, Mr. J. W. Tutt; Treasurer, Mr. A. H. Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and the Rev. G. Wheeler, M.A.; Librarian, Mr. G. C. Champion, F.Z.S., A.L.S.; and as other members of the Council Mr. R. Adkin, Professor T. Hudson Beare, B.Sc., F.R.S.E.; Mr. G. T. Bethune-Baker, F.Z.S.; Dr. M. Burr, D.Sc., F.L.S., F.Z.S.; Mr. H. St. J. Donisthorpe, F.Z.S.; Mr. J. H. Durrant; Professor Selwyn Image, M.A.; Dr. K. Jordan, Ph.D.; Mr. A. Sich, Mr. J. R. le B. Tomlin, M.A., and Mr. H. J. Turner.—The President having stated that the Royal Society were about to present the Darwin Medal to Mr. Roland Trimen, M.A., F.R.S., a Past-President of the Society, it was agreed unanimously to convey to the recipient the hearty congratulations of the Entomological Society of London.—Dr. Geoffrey Douglas Hale Carpenter, M.A., M.B., Uganda Medical Service, Uganda Protectorate; Mr. William B. Gurney, Assistant, Government Entomological Department of Agriculture, Sydney, N.S.W.; and Mr. J. C. Hawkshaw, Hollycombe, Liphook, Sussex, were elected Fellows of the Society.—The Hon. N. C. Rothschild brought for exhibition some examples of a rare Noctuid moth, *Oxytripia orbiculosa*, Esp., collected by himself and Miss Sarolta von Wertheimstein, at Puszta Peszer, in Hungary, during the first week of October of this year, where examples of both sexes were secured.—The exhibitor made some remarks on the curious habits of the moth, illustrated by photographs of one of the sandy spots in the wood it frequents, and recalled the adventurous history of its discovery and re-discovery in Hungary. He also showed examples of two species of flea, *Ctenocephalus canis* (dog-flea) and *Ctenocephalus felis* (cat-flea), and stated that, though still frequently considered to be identical, they were really quite distinct species. The exhibitor also remarked that the two had been united by Dr. Taschenberg under the name of *serraticeps*, a name which most certainly could not be retained.—Dr. G. Nicholson showed the example of *Lathrobium longipenne*, Fairm., taken by him at Croydon, in May, 1910, of which a specimen was exhibited by Commander J. J. Walker, at the last meeting of the

Society.—Professor T. Hudson Beare exhibited specimens of three species of beetles, all taken abundantly by him at Nethy Bridge, Inverness-shire, during July and August, 1910, viz. *Erirrhinus æthiops*, F., occurring in great abundance in a mere handful of flood refuse on the banks of the River Spey; *Criocephalus rusticus*, taken in numbers in the stumps of, and in small standing, Scots fir-trees on ground swept over by a forest fire some few years ago (there was no doubt that the larvæ had a preference for this burnt timber); and *Zeugophora turneri*, Pow., beaten in great profusion from aspens growing near Loch an-Eilan.—Mr. W. C. Crawley exhibited a colony of the ant *Lasius niger*, which had accepted as queen a female of *L. umbratus*, n 1908. Up to this autumn the only ants which had come to maturity in the nest were pure *L. niger*, thus confirming Reichenbach's experiments that *L. niger* hermaphrodites are able to produce hermaphrodites parthenogenetically. In connection with this exhibit Mr. H. St. J. Donisthorpe showed males, winged and wingless females, and hermaphrodites of *L. niger* and *L. umbratus* for comparison. He remarked that Father Wasman had recorded *umbratus* with *niger*, and that it is probable that *L. umbratus* female, being unable to found her own nests, is a temporary social parasite on *niger*. Mr. Donisthorpe also exhibited males, winged and wingless females, and hermaphrodites of *L. fuliginosus*, and pointed out that it was now proved that the females of this ant often founded their colonies with *umbratus*.—Mr. W. J. Kaye exhibited specimens of *Eueides pavana* (Heliconidæ), *Actinote thalia* (Acræidæ), and *Dismorphia actinote* from S. Brazil. Comment was made as to the very close resemblance between the first two. The resemblance was greatest on the under side, but the upper side also showed considerable convergence of colouring. The specimen of *E. pavana* exhibited had been caught and papered by Mr. Kaye as an example of the common *Actinote thalia*. The *Dismorphia*, while only a partial approach to the *Actinote* on the upper side, was extremely close on the under side, with the hind wing brought well over the fore wing in an attitude of rest.—Mr. L. W. Newman exhibited aberrant examples of *Abraxas grossulariata*; he also showed an interesting *Lycæna*, suggested to be a natural hybrid between *Agriades thetis* (*bellargus*) male × *Polyommatus icarus* female, taken wild near Folkestone, the under side showing both *thetis* and *icarus* characteristics, with those of *icarus* most pronounced, the upper side a fine *thetis* colour with white fringes, the shape of wings being also curious, rather suggesting *A. coridon* as being the male parent.—Mr. G. T. Bethune-Baker, having examined this exhibit, gave it as his opinion that the supposed hybrid was merely an aberrant form of *Polyommatus icarus*.—Mr. Philip J. Barraud brought for exhibition a case containing several series of a large form of *Satyrus statilinus* from the Aurunci Mountains, Southern-Central Italy; series of *Parnassius mnemosyne* var. *frühstoferi*, from Mount Petrella, Aurunci Mountains, 9000 ft.; series of *Colias edusa* and ab. *helice*, from Formia; very small specimen of *Gonopteryx cleopatra*, measuring 37 mm., from Formia; and four examples of a large form of *Pamphila comma* from Southern-Central Italy.—Dr. T. A. Chapman, M.D., F.Z.S., read a paper "On the Early Stages of *Latiorina* (*Lycæna*) *orbitulus*, Prun., an Amyrmecophelous Plebeiid Butterfly," and "On the Larva of *Orgyia splendida*, Rbr. (*dubia*)."—Mr. Edward A. Cockayne communicated "Notes on Insect Enemies in the Tropics, and their Influence on Mimicry." — Professor Christopher Aurivillius, Hon. F.E.S., communicated a paper entitled "New Genera and Species of Striphnopterygidæ, and Lasiocampidæ."

Wednesday, December 7th, 1910.—Mr. H. Rowland-Brown, M.A., Vice-President, in the chair.—Mr. R. Stewart McDougall, M.A., D.Sc., F.R.S.E., of Edinburgh University; and Mr. Hugh Frederick Stoneham, Lieutenant East Surrey Regiment, of "Kingswear," Streatham Park, S.W., were elected Fellows of the Society.—A letter of congratulation to Mr. Roland Trimen, F.R.S., from the Entomological Society of London, on the occasion of the award to him of the Royal Society's Darwin Medal, was read and approved.—The Vice-President announced that he had received from Dr. A. Feynes, a Fellow recently elected, and exhibited on his behalf, four boxes containing an admirable collection of North American Aleocharine Coleoptera, which the donor had offered most kindly to the Society. In the absence of any collections belonging exclusively to the Entomological Society of London, however, he had asked Dr. Feynes to authorize a transfer of the gift to the British Museum (Natural History), and he, therefore, with the consent of the meeting, handed it over to Mr. G. J. Arrow for that purpose.—Mr. H. W. Andrews exhibited a short series of *Carphotricha guttularis*, Mg., a scarce Trypetid, taken at Milford Haven in July last, and a specimen of a unicolorous form of *Prosena sybarita*, F., from North Kent, July 30th, 1910.—Commander J. J. Walker exhibited specimens, communicated by Mr. J. N. Halbert, of *Syagrius intrudens*, Wat., an Australian weevil, which had been introduced into a fernery at Glasnevin, Co. Dublin, where it had done considerable damage; also of *Conops signata*, Wiedemann, male and female, a Dipteron new to Britain, taken at Tubney, Berks, September 11th, 1910, and exhibited on behalf of the captor, Mr. Joseph Collins, of the Oxford University Museum.—Mr. E. C. Bedwell brought for exhibition examples of *Bruchus pectinicornis*, L., a beetle usually looked upon as introduced into this country in granaries, but in this case swept on an open hillside at Chipstead, Surrey; also a variety of *Badister bipustulatus*, F., the usual black patches on the elytra being reduced to two small black dots.—Mr. W. C. Crawley showed, with normal examples, a brachypterous female of the ant *Lasius flavus*, found at Oddington, near Oxford, in August, 1900, at which locality, about the same time, were observed females of *L. niger* with short wings. Mr. H. St. J. Donisthorpe remarked that Mrázek had recently shown that the short wings of *L. alienus* were caused by the ant being infested by a Nematode worm of the genus *Mermis*, and that Wheeler had found this to be the case with short-winged females of *L. neoniger* in America. He now exhibited a short-winged male of *Technomyrmex albipes*, Smith, together with an ordinary-winged male which he had recently taken at Kew, and suggested that the former might be caused in the same way; also ergatoid males of the same species, taken at the same time, and two forms of *Prenolepis braueri*, sub sp. *donisthorpei*, Forel, taken at Kew; a black form, hermaphrodites and male, taken in the Fern House, and a red form, hermaphrodites, from the Palm House.—Mr. H. M. Edelsten exhibited series of the following rare British Heterocera, viz. (*a*) *Dianthœcia luteago* var. *barrettii*, bred 1910, from Devon larvæ; (*b*) *Tapinostola extrema*, from Northamptonshire larvæ, July, 1910; (*c*) *T. hellmanni*, from larvæ taken in Wicken Fen, June, 1910; and (*d*) a pale variety of *Meliana flammea*, from larvæ collected in the Norfolk Broads, with a type-specimen for comparison. — Mr. H. Rowland-Brown exhibited, together with typical examples for comparison, two fine melanic variations of *Melitæa parthenie*, Bork., one of which resembled ab. *rhoio*, Oberthür (Lépid. Comparée, fasc. iv.), taken at 2800 ft. at Clelles, Isère, last July; and also two very remarkable black aberrations of *M. varia*, taken by him in company with Mr. C. J. Johnson, in 1907, at the top of the Simplon Pass.—Mr. H. C. J. Druce brought for exhibition a Nymphaline butterfly from the Himalayas, *Parhestina jermyni*, n. sp., with *Aporia agathon* var. *phryxe*, the Pierid it mimics closely—the subject of a paper read by him.—Mr. H. St. J. Donisthorpe, F.Z.S., read a paper entitled "Further Observations on Temporary Social Parasitism and Slavery in Ants."—Dr. T. A. Chapman, M.D., F.Z.S., read a paper on "Two New Species of *Lycænopsis* from Sarawak, Borneo."—M. Ernest Olivier communicated a paper entitled "Description of Two New Species of *Luciola* in the Collection of Mr. H. E. Andrewes."—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society.—*Oct.* 13*th*, 1910.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. West (Greenwich) exhibited a series of the Homopteron, *Linotettix stictogala*, beaten from tamarisk at Deal. It was gradually extending its range.—Mr. Colthrup, the nest of the Reed Warbler, suspended among a bunch of reeds.—Mr. Tonge, photographs of the young larvæ of *Celastrina argiolus* attacking ivy buds, and *Vanessa io* and *Pyrameis atalanta* at rest.—Mr. Newman, melanic example of *Bryophila perla* taken at Folkestone, a suffused pink specimen of *Anthrocera trifolii*, an example of *Spilosoma menthastri* with joined up spots approaching var. *walkeri*, several *Abraxas grossulariata*: (1) black markings especially wanting on all wings; (2) yellow marking much increased in area and black decreased, and (3) a very dark specimen, the black areas united and enlarged.—Mr. Adkin, a series of *Cossus ligniperda* from Lewisham, and read notes on the occurrence and pupation of the species.—Mr. Turner, living bred examples of *Lyonetia clerckella* and its mine in a birch leaf with the swung silken cradle in which the larva turned to pupa.—Mr. Moore, a variety of *Limnas chrysippus* var. *alcippus*, in which the apical white dot is duplicated, and *Acræa encedon* ab. *alcippina* from the same locality, Northern Nigeria.—Mr. Main, newly hatched larvæ of the glow-worm.—Dr. Hodgson, an example of *Callophrys rubi* with xanthic areas on the disc of all the wings, specimens of *Nemeobius lucina*: (1) a female in which the yellow area was much increased at the expense of the black; (2) a male in which the opposite was very strongly marked, a black example of *A. trifolii*, the only one obtained this year, and one with extreme red suffusion.—Mr. Rayward, ova of

Plebeius argus (*ægon*) laid naturally on *Erica cinerea*.—Dr. Chapman, Lepidoptera obtained by him in Sicily, *Oreopsyche kahri*, *Depressaria thapsialla*, *D. ferulæ*, &c.—Mr. Kaye, a box of Brazilian butterflies taken by him in the early part of the year, including *Morpho anaxibia*, *M. menelaus*, *M. hercules*, *M. lærtes*, *M. æga* and the rare *M. cytheris*, the beautiful *Papilio ascanius*, five species of *Heliconius*, species of *Catagramma* and *Callicore*, numerous very beautiful Erycinidæ, the Ithomiine *Mechomitis lysimnia* with its Pierine mimic *Dismorphia astyoche*, caught on the same flower-heads at Castro.—Mr. Sich, specimens of *Monopis weaverella*, a rare species only recently fully differentiated from *M. spilotella*. He also showed the hybernaculum of *Yponomeuta cognatellus* on *Euonymus* twigs.—Mr. Platt Barrett, a large collection of butterflies taken in Sicily during the last two years, and read a paper on the exhibit and the localities he visited, illustrating his remarks by a large number of lantern slides, including a series of views of Messina before and after the terrible earthquake of which he and his son were among the survivors.

October 27*th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Ashdown exhibited examples of the various species of Lepidoptera met with by him during a few weeks spent in Switzerland in July last, including *Apatura iris*, *Issoria lathonia*, *Melitæa phœbe*, *Limenitis camilla*, *Erebia lappona*, *Colias phicomone*, *Cupido osiris* (*sebrus*), and Mr. Newman, a living larva of *Polygonia c-album*, and a long series of females of *Agriades thetis* (*bellargus*), from Folkestone.—Messrs. H. Moore, Sich, R. Adkin, and L. Edwards exhibited numerous teratological specimens of Lepidoptera to illustrate the remarks of Dr. Chapman in his paper.—Mr. South, series of (1) *Coremia unidentaria*, bred from ova deposited by a reddish-banded female; the reddish and the black-banded forms were about equal in number; (2) *Acidalia aversata*, bred from ova deposited by a typical female, and gave an analysis of the banded and plain forms produced; (3) *Boarmia gemmaria*, bred from ova of var. *perfumaria*, the resultant imagines being almost all of the varietal form; (4) *B. abietaria*, specimens bred from New Forest larvæ; (5) *Pionea* (*Scopula*) *lutealis*, a series from Durham, whiter, more strongly marked, and larger than southern examples; and (6) greyish forms of *Larentia didymata*, from Weardale, Durham.—Mr. Schooling, a var. of *Arctia caja*, in which the fore wing markings were so aberrantly grouped and enlarged as to give no indication of what the normal marking was.—Dr. Chapman, a large number of teratological specimens lent him by Mr. Tutt, Mr. Pickett, Dr. Hodgson and others, to illustrate the paper he subsequently read, entitled "Notes on Teratological Specimens."

November 10*th*, 1910.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. W. G. Sheldon, F.E.S., of Croydon; Lieut. H. F. Stoneham, of Streatham; Mr. A. J. Lawrence, of New Oxford Street; and Mr. B. S. Curwen, of Richmond, were elected members.—Dr. Hodgson exhibited selected examples of *Agriades coridon*, mainly females, to show the prevalent slightly blue scaled form from Dover and Clandon in 1904 and 1906 respectively, and from Sussex, Surrey, and Herts, in 1910.—Mr. Platt Barrett, bred specimens of *Vanessa io* of a curious greasy-looking appearance, from mal-development of the scales.—Mr. R. Adkin, a bred series of *Lithosia caniola* from Devonshire, and read notes on the larval habits. They fed mainly on lichen and lettuce.—Mr. Newman, a curious specimen of "blue," which it was suggested might be a natural hybrid between *A. coridon* and *P. icarus* or *A. thetis* and *P. icarus*, and also a male *Polygonia c-album* with yellow ground, of which ten others had been reared.—Mr. Sich, *Limenitis populi*, taken by Mr. E. Sich in Austria.—Mr. Moore, *Perrhybis pyrrha* from Callao, Peru.—Mr. Turner, a teratological specimen of *Danais limniace* with a long indentation in the dwarfed left fore wing.—Mr. Buxton, a box of teratological specimens, including a number of species with the left hind wing dwarfed or missing.—Mr. Barnett, a series of *Acidalia rusticata* from Erith.—Mr. R. Adkin read the Report of the Conference of Delegates of the Corresponding Societies of the British Association. The remainder of the evening was devoted to the exhibition of lantern slides by Messrs. Lucas, Dennis, West, Tonge, and Main.

November 24*th*, 1910.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Annual Exhibition of Varieties.—Mr. Platt Barrett exhibited a very long series of *Melanargia pherusa* from Sicily to illustrate the variation of the species, and also of *M. galathea* to show various Sicilian local forms.—Mr. Sich, some of the more local species of the genus *Tinea*, including *T. fulvimitrella*, *T. picarella*, *T. confusella*, &c.—Mr. R. Adkin, a series of Eastbourne *Polyommatus icarus*, contrasting the spring and autumn females, showing strong development of the red markings, and including a fine under side aberration. He also showed a short series of hybrid *Nyssia zonaria* and *Biston hirtaria*, males and females.—Mr. Tonge, some extremely dark smoky *Cosmotriche potatoria* bred from Deal larvæ, a *Brenthis euphrosyne* with pale chocolate brown ground, from Polegate, several *Agrotis exclamationis* in which a large black blotch replaced the usual discal markings, and some excellent enlarged photographs of eggs of lepidoptera.—Dr. T. A. Chapman, a long series of *Pararge egeria* to show the great range of variation in Western and South Western Europe.—Messrs. A. Harrison and H. Main, several series of mainly bred *Boarmia repandata* to show the local variation in the North, South, and West of England and the West of Ireland.—Mr. Main, on behalf of Mr. Göttmann, various forms of *Vanessa io*, *Euvanessa antiopa*, and *Aglais urticæ* in the province of Yenesei, Siberia, extremely like the forms so frequently produced of late in temperature experiments, and of which Mr. W. Schmassmann exhibited a considerable number for comparison.—Mr. W. J. Lucas, the English trap-door spider, *Atypus affinis*, and several of its silken tubes, with a *Pterostychus madidus* discovered in one of them, and a small collection of butterflies taken by Patrol-leader S. F. Irwin, on his visit to Canada with Sir F. Baden Powell, including *E. antiopa*, *Anosia plexippus*, &c.—Mr. H. M. Edelsten, a fine bred series of *Dianthœcia luteago* var. *barrettii* from Devon, *Tapinostola extrema* bred from Northampton, and a specimen of *Leucania l-album*.—Dr. Hodgson, groups of varieties of British Rhopalocera and Anthrocerids to show somewhat extreme divergence of variation in each of several species, and also to show convergence of species in their variation.—Mr. A. E. Gibbs, the various Palæarctic forms of *Papilio machaon*, including a fine large *britannicus*, an *aurantiaca*, and spring and summer forms of the Japanese *hippocrates*.—Mrs. Hemming, Argynnids bred and captured in 1909–10, including melanic *Dryas paphia* and several under sides of the same species varying from brown to green.—Captain Cardew, an extremely dark specimen of the ab. *fusca* of *Cœnobia rufa* from Norfolk, *Anthrocera viciæ* ab. *confusa*, extremely light and dark forms of *Fidonia carbonaria* from Rannoch, a unicolorous male of *Epione advenaria*, and a light straw *Ematurga atomaria*.—Mr. Scorer, a *Euchelia jacobææ* with the costal streak and apical spot united, and a pale salmon coloured example, specimens of *Euchloë cardamines* with very large discal spots, and a *Grammesia trilinea* with a strongly elbowed outer discal line.—Mr. Percy Bright, a large number of the finest aberrations of numerous species of British Lepidoptera, including forty-one very striking examples of *Abraxas grossulariata*, from almost unicolorous white to nearly entirely yellow, and a bred small specimen without scales; a *Triphæna fimbria* with white replacing the yellow; an extreme melanic *Eubolia bipunctaria*; a gynandromorph of *Fidonia atomaria*; an *adonis*-like *Polyommatus icarus*; several *Polygonia c-album* with straw yellow ground; a *Pieris napi* with blackish outer margins; an extremely blue female of *Agriades thetis* with unusually large orange spots; a *Pseudoterpna pruinata* with black bands across the wings, &c.—Mr. R. South, on behalf of Mr. Yates, of St. Anne's-on-Sea, a series of *Luperina guenéei* taken this year, and a series of very varied forms of *L. testacea* with which he compared and contrasted them in detail; a short series of bred *Phibalapteryx lapidata* from Glasgow ova; and three specimens of *Oria* (*Synia*) *musculosa* taken by Mr. H. Haynes, near Salisbury, in 1909.—The Rev. F. D. Morice, a collection of about three hundred of the most conspicuous and handsome European and Mediterranean species among the sawflies, chrysids, ants, fossorial wasps, and true wasps, and gave a very interesting short account of the habits in the various groups.—Mr. H. W. Andrews, a unicolorous grey form lacking the yellow markings of the dipteron *Prosena sybarita*, from N. Kent.—Mr. Edwards, numerous W. African species, chiefly the genus *Cymothoë*, which show very strongly marked sexual dimorphism.—Mr. West (Greenwich), his collection of British Homoptera.—Mr. Masters, a *Vanessa atalanta* taken in Jersey, with blotched and confused markings comparable only to those produced in recent temperature experiments with the species.—Mr. Blenkarn exhibited a specimen of the genus *Ephyra*, with marking suggestive of both *E. porata* and *E. punctaria*.—Rev. J. E. Tarbat, specimens of a very light form of *Nemeophila plantaginis* from S. Hants, and a very dark form from Witherslack.—Mr. W. G. Sheldon, a fine series of all the European species of *Neptis*, *Apatura*, and *Limenitis* taken by him in Hungary, Switzerland and France.—Mr. H. Page sent two beautiful series of *Polyommatus escheri* and *Cœnonympha dorus*, from Abries and Digne respectively, in July, 1910.—Mr. L. W. Newman, long and varied series of closely inbred *Ennomos alniaria*, showing the washed-out appearance produced; a fine set of the melanic form of the species; hybrid *Smerinthus ocellatus*, male × *Amorpha populi*, female; both males and a female; a long series of hand-painted figures of the finest aberrations bred by him; on behalf of Mr. Marshall, *Lycæna* *orion* with only the orbicular spots present, *Noctua subrosea* from the Bond collection, *Melitæa artemis* with heavily marked white wedges on all the wings, &c.—Mr. W. B. Pratt, ab. *coracina* of *Melitæa athalia* from W. Sussex; and *Melitæa aurina* with under side of hind wings having a black base and an extremely wide white central band.—Mr. W. J. Kaye, a complete transitional series between *Heliconius phyllis* form *anacreon*, and *H. phyllis* form *venusata* from the same locality in E. Bolivia.—Mr. T. L. Barnett, a large number of species taken by him this August in Wicken Fen, including *Tapinostola hellmanni*, *Leucania straminea*, *Nudaria senex*, *Herminia cribralis*, *Bankia argentula*, *Cœnobia rufa*, &c.; a bred specimen of *Ægeria andreniformis* and its pupa case; and specimens of *Æ. culiciformis*, which had been somewhat common at Darenth Wood.—Hy. J. Turner, *Hon. Rep. Secretary*.

Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, October 17th, 1910. Mr. F. N. Pierce, F.E.S., in the chair.—This was the opening meeting of the session, and was devoted to exhibits of the season's work.—Mr. T. Baxter, of St. Anne's, sent for exhibition a fine series of *Luperina gueneei* and its variety *baxteri*; he also contributed a note in which he pointed out that both forms were represented in a perfectly fresh condition, and that the view that the var. *baxteri* would become the typical *gueneei* with age must be abandoned. Mr. Baxter also sent an extraordinary aberration of *Abraxas grossulariata* which had the costal area of the left fore wing typical, the remainder, about three-fourths of the wing, being black; the right fore wing and the hind wings were typical. This fine asymmetrical specimen was captured in his garden at St. Anne's.—Mr. H. R. Sweeting exhibited a long series of *Hydræcia crinanensis*, captured this year near Londonderry; the variation appeared to be on exactly parallel lines with *nictitans*. The identity of the species was established by Mr. Pierce, who had an opportunity to examine the genitalia while the insects were still fresh. The same member further showed the following insects from Mold, North Wales, viz.: *Tæniocampa gothica*, including an asymmetrical example in which the U mark on the left fore wing was only partly developed; *T. incerta*, *T. stabilis*, *Pachnobia rubricosa*, *Noctua festiva*, *N. brunnea*, *Aplecta prasina*, and *Boarmia repandata*, including an example of var. *nigra*.—Mr. F. N. Pierce showed *Abraxas grossulariata*, a short series from Wallasey, in which the variation was less striking than usual.—Mr. Wm. Mansbridge brought a series of the very black Knowsley race of *B. repandata* var. *nigra*, in which the submarginal pale line was almost absent; also short series of the same insect from Bude and Delamere Forest; *Boarmia gemmaria*, black form from North Kent; pale forms from North Devon, and var. *perfumaria* from the Cotswolds; a long series of *Aplecta nebulosa*, var. *robsoni*, var. *thompsoni*, and grey forms from Delamere.—Mr. Prince showed a fine series of *Cidaria reticulata* from Windermere, and a box of *Oporabia filigrammaria*, varying from nearly white to very dark fuscous, from Derbyshire.—Mr. R. Tait, Jun., exhibited the following, mostly in long series, viz.: *Agrotis agathina*, rosy form from North Wales; *Lithosia complana*, *Agrotis ripæ*, *Epione apici-*

aria, *Leucania putrescens*, *Boarmia abietaria*, *Ellopia prosapiaria*, from Pendine, South Wales; *Arctia villica* and *Numeria pulveraria*, from Abbotswood; *Tæniocampa munda* and *Pachnobia leucographa*, from Lakeside, Windermere; *Tephrosia luridata* and *Cymatophora fluctuosa*, from Wyre Forest; *Apatura iris*, bred from Hunts larvæ, and *Phigalia pedaria*, varying from pale to black, from Mansfield, Notts.—Mr. B. H. Crabtree brought *Tæniocampa munda* and *T. gothica*, a series of each (bred), from Windermere; a series of *Charæas graminis*, taken at light at Seascale; *Oporabia filigrammaria*, a varied series from Kinderscout, Derbyshire; *Biston hirtaria*, from Aviemore larvæ which had been in pupa for two years; vars. of *Abraxas grossulariata* from Huddersfield larvæ.—Mr. C. F. Johnson exhibited the following:—*Asteroscopus nubeculosa* and *Nyssia lapponaria*, from two-year-old pupæ from Rannoch; *Pachnobia leucographa*, *P. rubricosa*, and *Tæniocampa munda* (bred), from Windermere; a long and varied series of *Oporabia filigrammaria*, from North Derbyshire; *Boarmia repandata*, from North Wales, North Staffordshire, and Knowsley, Lancashire, showing very varied forms; a specimen of *Abraxas grossulariata* var. *nigrosparsata* (bred), from Huddersfield.—The Rev. A. Miles Moss read a paper on the "Sphingidæ of Peru," and exhibited a magnificent collection of this group which he had made during the course of a three years' residence in Lima. The paper was further illustrated by a large number of beautiful water-colour drawings of the larvæ and food-plants of most of the species exhibited.—H. R. Sweeting & Wm. Mansbridge, *Hon. Secs.*

The Manchester Entomological Society. — *November* 21*st*, 1910.—The first meeting of the 1910–11 session was held in the Manchester Museum, Owens College, on October 5th, Mr. C. F. Johnson, the President, in the chair.—The following exhibits were made of insects taken and bred in 1910:—Mr. R. Tait, Jun., F.E.S.: Series of the following insects:—Bred *Arctia villica* from Sussex ova, including one blotched variety; bred *Tæniocampa leucographa* and *munda* from Lakeside; *Phigalia pedaria* from pale forms to var. *monacharia*, taken at Mansfield, Notts; *Tephrosia luridata*, taken in May in Wyre Forest. Long bred series of *Coremia ferrugata* and *C. unidentaria* from Witherslack; *Lithosia complana*, *Agrotis ripæ*, *Leucania littoralis*, bred *Epione apiciaria*, *Boarmia abietaria*, *Ellopia prosapiaria*, and *Leucania putrescens*, all from South Wales. Bred *Numeria pulveraria* from Sussex; two specimens of *Palimpsestis fluctuosa* from Wyre Forest; four bred *Apatura iris* (female) from Hunts; bred *Melitæa aurinia* from Berkshire larvæ.—Mr. W. P. Stocks, F.R.C.S.: Short series of *Dianthœcia capsincola*, *D. cucubali*, and *Eupithecia venosata*, bred from campion flowers from Llanrwst; four *Tephrosia biundularia* from Bideford, belonging to the March–April brood, three of these being small and ochreous, the fourth being larger and paler and much more like the May–June brood; *Amphidasys strataria* and *Cossus ligniperda* from Bideford. Series of *Lycæna astrarche* with var. *allous* from Silverdale; of *L. minima* and *Cœnonympha typhon* from Witherslack. An example of *Nemoria viridata*, of a bright fulvous yellow colour, taken at Witherslack; melanic *Thera variata* from Witherslack. Series of *Melanthia albicillata*, *Abraxas sylvata*, *Nola confusalis*, *Ino geryon*, *Mamestra dissimilis*, *Lygris testata*, *Mamestra thalassina* (one dark form), *Numeria pulveraria*, *Malenydris salicata* (examples of both broods), *Cidaria truncata*, and an example of *Epione apiciaria*—all from Silverdale.—Mr. B. H. Crabtree, F.E.S.: Series of *Charæas graminis* and an example of *Agrotis præcox* from Seascale. Bred series of *Tæniocampa munda* and *gothica* from Lakeside, of *Lycia hirtaria* from Aviemore (two years in pupa), of *Aplecta nebulosa* var. *robsoni* from Delamere, of *Boarmia repandata*, types from Delamere, and ab. *nigra* from Delamere and Knowsley. Bred vars. of *Abraxas grossulariata*.—Mr. A. E. Wright: Bred series of *Oporabia filigrammaria* from Burnley; series of *Hydriomena impluviata*, types and var. *infuscata*, from Burnley; series of *Ematurga atomaria* from Witherslack, Burnley (including two fine dark unicolorous specimens), and Delamere; series of *Thera variata*, and *Cidaria corylata* from Delamere. —Mr. L. Nathan: *Phalera bucephala*, *Amphidasys betularia* var. *doubledayaria*, *Tephrosia biundularia*, *Cabera pusaria*, *Notodonta dromedarius*, and *Lophopteryx camelina*, bred from Delamere larvæ; *Satyrus semele*, *Epinephele ianira*, *Lycæna icarus*, *Agrotis vestigialis*, and *Lygris testata* from Lytham; *Lymantria monacha*, bred from Kent ova.—Mr. G. Storey: From Wicken: *Papilio machaon*, *Smerinthus ocellatus*, *Earias chlorana*, *Phragmatobia fuliginosa*, *Phragmatæcia castaneæ* (*arundinis*), *Gastropacha quercifolia*, *Pterostoma palpina*, *Arsilonche albovenosa*, *Leucania obsoleta*, *Meliana flammea*, *Grammesia trigrammica*, *Mamestra dissimilis* (*suasa*), *Bankia argentula*, *Hydrelia uncula*, *Lomaspilis marginata*, and *Collix sparsata*. From Cambridge: *Metopsilus porcellus*, *Pœcilocampa populi*, *Pheosia tremula* (*dictæa*), *Mamestra genistæ*, *Asteroscopus sphinx*, *Plusia moneta*, *Himera pennaria*, and *Eupithecia consignata*. From Tuddenham: *Arctia villica*, *Emmelia trabealis* (*sulphuralis*), *Acidalia rubiginata* (*rubricata*), *Eupithecia lariciata*, *Lithostege griseata*. From Brooklands, Cheshire: *Xylophasia rurea* var. *combusta*, *Agrotis saucia*, *Mamestra contigua*, *Perizoma alchemillata*, *Eupithecia sobrinata*.—Mr. W. B. Lees: *Cœnonympha pamphilus*, *Parasemia plantaginis*, *Venilia maculata*, *Plusia pulchrina*, *Calymnia trapezina* (bred), from Dovedale. *Hepialus humuli*, *Phalera bucephala* (bred), *Acronycta megacephala* (bred), *Orgyia antiqua* (bred), *Xylophasia lithoxylea*, *Gonodontis bidentata* ab. *nigra*, and *Hybernia marginaria* var. *fuscata*, from South Manchester. *Acronycta alni* (bred) from Northwich, *Hepialus sylvina* from Styal, and *Ematurga atomaria* from Delamere.—Mr. W. Buckley: Series of the following:—*Tæniocampa opima* from Wallasey ova, *Mamestra pisi* from Penmaenmawr ova, *Agrotis ashworthii*, *Dianthœcia conspersa* from campions in Anglesea, *Plusia moneta* from Woking larvæ, *Phalera bucephala* from Urmston larvæ, *Ino geryon* from Dovedale, *Amphidasys betularia* and intermediates between the type and var. *doubledayaria*, bred from Urmston larvæ.—Mr. A. W. Boyd, F.E.S.: Series of the following:—*Phigalia pedaria* types and var. *monacharia* from Dunham Park; *Ematurga atomaria* (varied forms) from Delamere and Rudheath; *Aplecta nebulosa*, vars. *thompsoni* and *robsoni*, bred from Delamere larvæ; *Ino geryon*, *Asthena blomeri*, and *Eustroma silaceata* from Dovedale;

Eucosmia undulata, *Asthena testaceata*, *Venusia cambrica*, and *Bomolocha fontis* from South Cheshire. An example of *Cabera exanthemata* ab. *approximata* bred from a Delamere larva; a series of *Bryophila glandifera* from North Devon, ranging from pale yellow to dark green.—Mr. A. E. Salmon: Living larvæ and cocoons of *Philosamia ricini* and *cynthia*; larvæ of *Cricula andrei* (just hatched); ova of the hybrid between *Caligula japonica* male and *simla* female, laid on September 1st, and the two parents.—Mr. J. H. Watson: Living ova of the leaf-insect, *Pulchryphyllum crurifolium*, from the Seychelles Islands, showing that even these imitate the seeds of a plant. A living example of the silk-moth, *Argema mimosæ*, from South Africa, and the cocoon it had just emerged from; two live *Philosamia ricini* and larvæ in various stages, from Bengal; also a new moth belonging to an aberrant group of the Saturnidæ (*Hemileuca* sp.), allied to *H. newmægeni* (H. Edwards)—the specimens bred from pupæ collected in the neighbourhood of the Truckee Pass, on the Californian-Nevada divide of the Rocky Mountains; other species of the Hemileucinæ, including *H. maia* var. *nevadensis*, *electra*, and *Pseudohazis marcata*, &c.—Mr. J. E. Cope: The following Coleoptera:—*Cicindela campestris* from Delamere; *Carabus nemoralis*, *catenulatus*, *granulatus*, *violaceus* (July), *Pterostichus vulgaris* (April), and *Dytiscus marginalis* (August), from Ashton Moss; *Byrrhus pilula*, *Corymbites æneus*, and *Elater balteatus*, with larvæ and wood-borings, from Delamere; *Cetonia aurata* from Bournemouth; dissected mouth-parts of *C. nemoralis* and *catenulatus*, and of *P. vulgaris*.

November 2*nd*, 1910.—Mr. R. Tait, Jun., F.E.S., opened a discussion on the Lithosiinæ or "Footman" moths, illustrating his remarks with series of insects from his collection. The following exhibits were made:—Mr. J. H. Watson, living cocoons of the Saturnidæ: *S.* var. *meridionalis* from Syria, *S. spini* from Lower Austria, *S. cephalariæ* var. *haversoni* from Armenia, *S. pyretorum* from China, *S. pavonia* from Yorkshire.—Mr. Wm. Mansbridge, F.E.S., series of *Dianthœcia carpophaga*, light forms from Eastbourne; *Boarmia repandata* from North Cornwall and Delamere, *B. gemmaria* from North Kent (black) and North Devon (light), *Mesoleuca albicillata* from Silverdale ova, *Aplecta nebulosa* with vars. *thompsoni* and *robsoni*.—Mr. H. Garnett exhibited under the microscope two species of Hymenoptera from Withington, Manchester, taken on October 2nd, 1910, one being *Anagrus incarnatus* female, "the Golden Fairy-Fly," and the other a species of *Cosmocoma*.—Mr. A. E. Wright showed a living *Dasypolia templi* female from Burnley.—Mr. A. W. Boyd, F.E.S., a box of Micro-Lepidoptera mainly from Cheshire localities.—Mr. C. F. Johnson, F.E.S., exhibited series of *Tephrosia punctularia* and *Thecla rubi* from Cannock Chase, *Nola confusalis* and *Chloroclystis debiliata* from Burnt Wood, *Drymonia chaonia* and *Cerura furcula* bred from larvæ from the Lake District; a long and varied series of *Oporabia filigrammaria* from North Derbyshire, *Asteroscopus nubeculosa* and *Nyssia lapponaria* from two-year-old pupæ, *Tæniocampa leucographa* and *munda* bred from the Lake District, *Eucosmia certata* from Market Drayton, and an example of *Abraxas grossulariata* var. *nigrocærulea* from Huddersfield.—A. W. Boyd, *Hon. Sec.*

RECENT LITERATURE.

1. *The Annals of Scottish Natural History.* Edinburgh, 1910.

Perhaps a somewhat greater amount of entomological matter appears in this volume than in the last. The papers and notes are:—Scottish Phoridæ [Diptera], with Tables of all the British Species, and Notes on Localities (J. R. Malloch); *Ornithobius cygni* [Mallophaga], a Swan Parasite at Port-Allen-on-Tay (J. Waterston, B.Sc.); *Ornithobius goniopleurus* on Barnacle Goose (W. Evans); Aquatic Coleoptera of the Mid-Ebudes (F. B. Browne, M.A.); Further Notes on Nocturnal Hymenoptera (P. Cameron); On the Scottish Species of Oxyura (Proctotrypidæ), pts. iv. and v. (P. Cameron); Insect Fauna of Grouse Moors (P. H. Grimshaw); *Nyssia zonaria* in the Outer Hebrides (P. H. Grimshaw); Scottish Dragonfly Records (W. J. Lucas, B.A.); Notes on Siphonaptera (W. Evans); Some Terrestrial Invertebrates from Fair Isle (W. Evans); Insect Visitors of *Fumaria officinalis* (S. E. Brock).

2. *Monographia de los Nemoptéridos* (*Insectos neurópteros*). [Memorias de la Real Academia de Ciencias y Artes de Barcelona.] By R. P. Longinos Navas, S.J. Barcelona, July, 1910.

Those who take an interest in the Neuroptera will welcome this monograph of one of the most peculiar divisions of the order—insects with hind wings narrowed into the form of tails, often with one or more dilatations in their length. The article of seventy pages on large paper has a coloured plate, and twenty-four illustrations in the text. It is perhaps a misfortune for British naturalists that it is written in Spanish. Most of the forty-four species belong to Africa; five only are European, none unfortunately being British.

Other recent papers by the same author are:—

(i.) *Mis excursiones entomológicas durante el verano de 1909.* (Bul. Ins. Catal. Hist. Nat.)

(ii.) *Hemeróbidos* (*Ins. Neur.*) *nuevos, 1910.* (Brotéria, Ser. de Vul. Scien.)

(iii.) *Osmylides exotiques nouveaux, 1910.* (Ann. Soc. Sci. Brux.)

(iv.) *Hémérobides nouveaux du Japon* (*Neuroptera*). (Revue Russe d'Entom. 1909); written in Latin.

3. *Dermaptera of the Seychelles.* By M. Burr, D.Sc. Trans. Linn. Soc. Lond. vol. xiv. pt. 1. November, 1910. Illustrated.

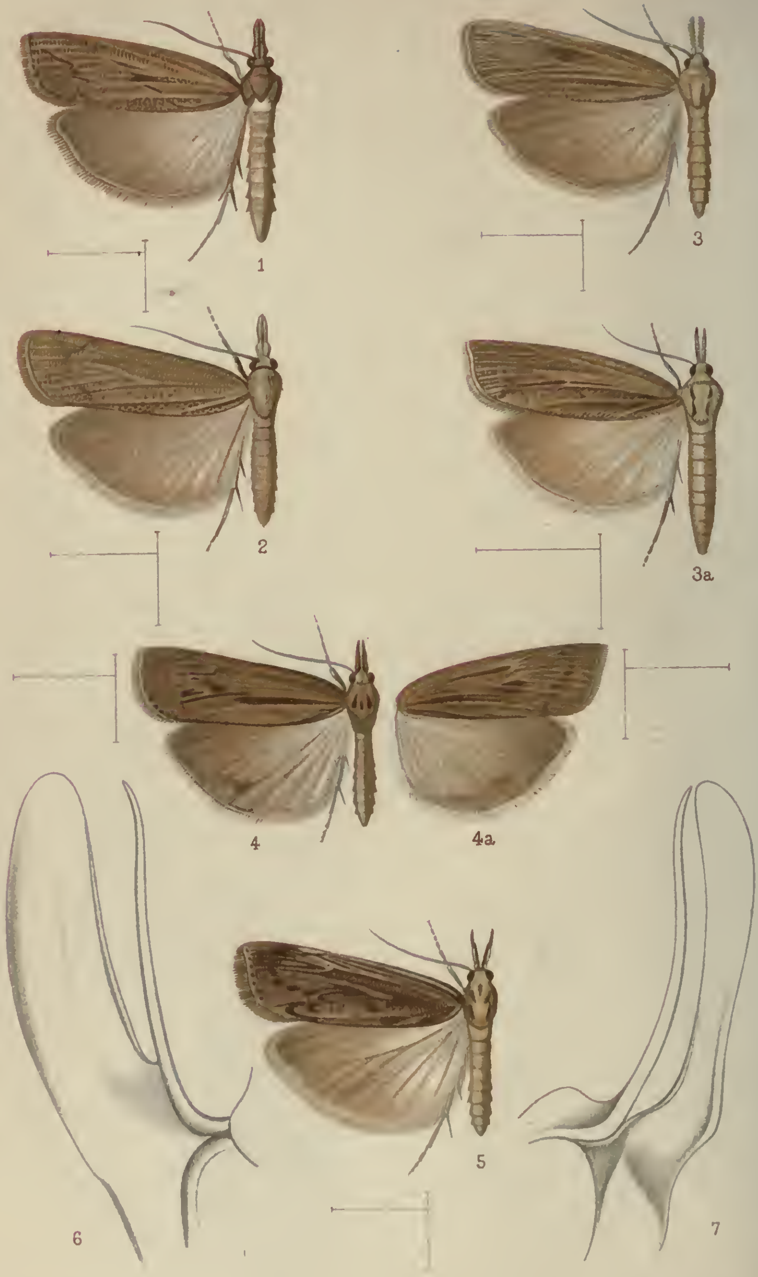
4. *Annals of Tropical Medicine and Parasitology.* Series T. M., vol. iv. No. 2. Liverpool, July, 1910.

The only contact with entomology is of course in connection with the cause of malarial diseases. Mosquitoes, therefore, figure largely in the part before us.

5. *Memorias do Instituto Oswaldo Cruz.* Ano 1910, Tomo ii. Fasciculo 1. Rio de Janeiro, 1909.

A beautifully illustrated periodical; but this part deals with animals much lower than insects.

W. J. Lucas.



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SOME SPECIES OF CRAMBI.

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SOME SPECIES OF CRAMBI, WITH DESCRIPTIONS OF TWO NEW ONES.

By the Hon. N. Charles Rothschild, M.A., F.L.S.

(Plate I.)

Mr. Geza Uhryk collected in several localities for me in Hungary during the year 1909. In July, at Drava Sarvas, Szerem Co., he obtained a single male specimen of a *Crambus* which seemed to me quite different from any species which I knew. Dr. Rebel, to whom I submitted this Drava Sarvas example, pronounced it to be undoubtedly a new species, unless it were identical with the recently described *Crambus hungaricus* (Pl. I. fig. 5), which he had not seen, and with specimens of which he advised me to compare my example. Through the kindness and courtesy of the Director and the Lepidopterist of the Hungarian National Museum, I have been able to examine specimens of *C. hungaricus*, Schmidt (Arch. Zool. i. No. 9, pp. 31–32, 1909), and to submit the same to my friend Dr. Jordan, together with the single specimen of the new species referred to above, and a series of *C. contaminellus* (Pl. I. fig. 1). Dr. Jordan has kindly sent me numerous notes on these insects, upon which the remarks and descriptions of the present article are based.

Crambus hungaricus has a fully-developed retinaculum projecting from the costa of the fore wing, like *C. geniculeus*, *C. selasellus*, *C. culminellus*, and others; whereas the present new species has only a tuft of scales projecting forward from the median vein, as obtains in *C. contaminellus*, *C. inquinatellus*, *C. perlellus*, *C. tristellus*, and allies. The antennæ of *C. hungaricus* (male) are prominently serrated, as stated by the author. The clasper of that sex is broad and sole-shaped, and is devoid of the long rod found in *contaminellus* and the present new species. The scaling on the outer surface of the clasper, moreover, is similar to that of the abdomen, while in *contaminellus* and the present new species the scales are long and narrow. I feel, therefore, justified in describing the specimen as representing a new species.

Crambus uhryki, sp. nov. (Pl. I. figs. 2 and 6.)

♂. Similar to *C. contaminellus*, Hübn. Fore wing shorter, the apex more rounded, the outer margin not being incurved or straight below the apex, as is the case in *C. contaminellus*; upper surface without white scales, the black dusting as in the species mentioned, but no black dots at margin; fringe darker, whereas in *C. contaminellus* the long as well as the short scales of the fringe have white tips; the long scales in the new species have a dark apex, median line not marked, discal line very indistinct, in the same position as in *C. contaminellus*, but not at all angulated. Hind wing broader, fuscous, lighter below the cell, apex more rounded than in *C. contaminellus*; the fringe more uniform in colour, not showing such a prominent dark line as in the allied species. Genitalia: Both the dorsal and ventral process of the anal segment a little broader than in *C. contaminellus*, the dorsal one nearly straight in a lateral view, only the extreme tip being curved downwards; the ventral process broader than the dorsal one in a view from above. Clasper composed, as in the allied species, of two pieces, both of about the same length, the ventral piece broad and but feebly chitinized, with the apex rounded. This piece is of practically the same width throughout, being about twice as broad as it is in *C. contaminellus*. Its inside is densely covered with erect narrow scales, recalling a cloth brush. The second piece of the clasper consists of a long rod-like, strongly chitinized process, which originates dorsally at the base of the first piece. This rod bears a dense fringe of hairs, which in *C. contaminellus* are less numerous. Moreover, the rod is less curved and less hollowed out along the inner surface than in that species.

One male; Drava Sarvas, Szerem Co., Hungary, July, 1909. Coll. G. Uhryk. (Type in the Tring Museum.)

Crambus salinellus nepos, subsp. nov. (Pl. I. figs. 3, 3*a*, and 7.)

There are two closely allied species of *Crambus* known from England—*C. contaminellus*, Hb. (Pl. I. fig. 1), and *C. salinellus*, Tutt (Pl. I. figs. 4 and 4*a*). The former is reported to be widely distributed on the Continent, although some of the records may refer to some other closely related species. As far as I know, *C. salinellus* has hitherto only been recorded on the Continent from Germany, but I am now able to add a form of that species to the Hungarian fauna. The two species *contaminellus* and *salinellus* can be separated from one another by the following three chief distinguishing characters:—

In *salinellus* the line situated on the fore wing about half-way between the cell and the distal margin is evenly curved from the costal margin to the lower median vein, while this line is dentate in *contaminellus*. The patagia are conspicuously edged with black in *salinellus*, while there are no black scales on them in *contaminellus*

The long rod-like process of the clasper is longer in *salinellus* than the elongate sole-shaped main portion of the clasper, and shorter than that flap in *contaminellus*. Moreover, the rod-like process is thicker in *contaminellus* than in *salinellus*.

A long series of specimens from Flamenda, Deliblat, Hungary, collected in June, 1909, by Mr. Geza Uhryk, and which did not appear to me to agree with what I knew as *contaminellus*, prove on closer examination to agree with *salinellus* from the east coast of England, except in some minor points. The specimens, taken all round, are larger than British *salinellus*, and are less marked with black on the fore wing. The black streak which is situated below the cell, and connects the two lines extending towards the base, is much fainter in the Hungarian specimens than in British ones, and the angle formed by the outer line below the lower vein is much less prominent in the former. Moreover, the patagia have fewer black scales on the whole; some females are altogether without black on the patagia, and have also no black marginal dots on the fore wing. The genitalia do not differ from those of British *salinellus*, except that the rod-like process of the clasper appears to be a little longer.

A large series of both sexes taken in June, 1909, at Flamenda, Deliblat, Hungary, by Mr. Geza Uhryk. (Type in the Tring Museum.)

EXPLANATION OF PLATE I. — 1. *Crambus contaminellus*, Hb. 2. *C. uhryki*, sp. nov. 3, 3*a*. *C. salinellus* nepos, subsp. nov. 4, 4*a*. *C. salinellus*, Tutt. 5. *C. hungaricus*, Schmidt. 6. *C. uhryki*, male clasper. 7. *C. salinellus* nepos, male clasper.

SURREY ORTHOPTERA.

(EARWIGS, COCKROACHES, CRICKETS, AND GRASSHOPPERS.)

BY W. J. LUCAS, B.A., F.E.S.

IN the Orthoptera we have a particularly interesting group of insects, since, with the exception of a few very primitive species, which themselves have sometimes been placed with the Orthoptera, this Natural Order probably contains the oldest insects which have come down to the present geologic age.

Those which breed in the British Isles are but thirty-nine, while of these eight are not indigenous and are therefore not usually to be met with under natural conditions. Casual visitors, especially from amongst the Cockroaches, often appear, but of course must not be looked upon as British insects. Out of the thirty-nine some twenty-seven are at present known to occur in Surrey.

As might be expected, there is much diversity to be found amongst the members of so ancient a group of insects. Consequently it is necessary to subdivide the Orthoptera into a number of Groups or Suborders. Those which contain British representatives are :—FORFICULODEA (Earwigs, &c.); BLATTODEA (Cockroaches); GRYLLODEA (Crickets); LOCUSTODEA (Long-horned Grasshoppers); ACRIDIODEA (Short-horned Grasshoppers). The MANTODEA (Praying Insects) and PHASMODEA (Leaf and Stick Insects) are not represented in these Islands.

Of the seven British FORFICULODEA (all Earwigs) Surrey is able to claim four, while two of the others—*Labia arachidis*, Yers. (indoors), and *Apterygida albipennis*, Meg.—are quite likely to occur.

Anisolabis annulipes, Lucas, is a dark wingless species which sometimes breeds in this country under artificial conditions. It has been accidentally imported with plants into Kew Gardens, but so far has not established itself there.

Labia minor, Linn., is often taken on the wing, flying round cucumber-beds, manure-heaps, &c., in the sunshine. Records are: Kew Gardens, April 14th, 1897 (W. J. L.); Kingston-on-Thames, April 27th, 1897 and June 2nd, 1899 (W. J. L.); Surbiton, July 14th, 1907 (W. J. L.); Wandsworth, August 15th, 1889 (Eland Shaw); Southwark Street, near Blackfriars Bridge, September 30th, 1908 (F. M. Dyke); Oxshott, October 3rd, 1908 (S. R. Ashby); Headley Lane, an example with large callipers (A. J. Chitty); Leatherhead (C. A. Briggs); Dormans (M. Burr); Reigate (E. Saunders); Dorking (H. L. F. Guermonprez).

Forficula auricularia, Linn., is one of our commonest insects, and is universally distributed. An interesting form—the variety named *forcipata*—has very highly developed callipers. A dark specimen of the typical form was taken, August 5th, 1900, by Mr. F. B. Jennings at Boxhill. While this earwig feeds normally on insects and animal food of a similar nature, it often does damage to dahlias, hops, and other cultivated plants. This insect and the next hybernate in the perfect form.

Forficula lesnei, Finot, is something like the common earwig, but is rather smaller, is brighter in colour, and has no wings. Its callipers, too, are of a different shape. It has been taken at Boxhill and Reigate (W. West); near Leatherhead (W. J. Ashdown); at Ranmore (W. J. L.); Merrow Downs, between Guildford and Newlands Corner (J. J. Walker).

All but one of the BLATTODEA known to breed in Britain have been found in Surrey, the one exception being the smallest indigenous species, *Ectobius panzeri*, Steph. If this occurs so far inland, it should be expected on heathy ground. The genus *Ectobius* alone is native.

Ectobius lapponicus, Linn.—Haslemere, June 22nd (Eland Shaw); near Boldermere, Wisley, July 5th, 1902 (W. J. L.); Devil's Punch Bowl, Hindhead, July 15th, 1909 (W. J. L.); Dorking (A. J. Chitty).

Ectobius perspicillaris (= *lividus*), Herbst.—Boxhill (C. A. Briggs); Mickleham (W. J. Ashdown).

Blattella germanica, Linn.—Aldershot (M. Burr), and no doubt in many London hotels and restaurants. This and the next four are seldom found out of doors.

Blatta orientalis, Linn., is universally distributed over the county.

Periplaneta americana, Linn.—Kew Gardens (W. J. L.).

Periplaneta australasiæ, Fabr.—Kew Gardens (W. J. L.).

Pycnoscelus surinamensis, Linn.—Kew Gardens (W. J. L.); the latest cockroach to establish itself in this county.

Of the GRYLLODEA there are but four British species, of which three have been found in Surrey. The fourth, *Nemobius sylvestris*, Fabr., occurs freely in the New Forest, and there seems to be no reason why it should not be found in Surrey, amongst dead leaves in old, dry, mixed woods.

Gryllus campestris, Linn.—I have but one record, Rotherhithe, 1904 (H. Moore).

Gryllus domesticus, Linn.—This is no doubt distributed throughout the county, though not out of doors, except sometimes in the summer; but I have records only for: Kingston-on-Thames (W. J. L.); Bisley (A. Ficklin, Junr.); Bayswater (F. P. Pascoe).

Gryllotalpa gryllotalpa, Linn.—Churt, 1901, and Milford, June 3rd, 1902 (G. Dalgliesh). The latter example was met with on the wing.

Nine insects belonging to the LOCUSTODEA are British. Out of these *Conocephalus dorsalis*, Latr., *Metrioptera albopunctata* (= *grisea*), *M. roeselii*, Hagen., and *Tettigonia verrucivora*, Linn., have not, I believe, been recorded for Surrey. *C. dorsalis* may be looked for on boggy ground, but *M. albopunctata* is a coast species, and the other two are very rare.

Leptophyes punctatissima, Bosc (July to September).—Merrow Downs (W. J. L.); Boxhill (C. A. Briggs); Bisley (A. Ficklin, Junr.); near Guildford (B. G. Cooper); Dorking (H. Guermonprez); Farnham (E. J. B. Sopp); Send (L. Rawes); near Ashtead (W. J. L.); Walton-on-Thames (H. E. Annett); Oxshott (R. South); Surbiton (H. Goss); Wimbledon and Dormans (M. Burr).

Meconema thalassina De Geer (= *varium*) (July to October).—Leatherhead and Horsley (C. A. Briggs); near Ashtead (W. J. L.); Kingston-on-Thames (W. J. L.); Surbiton (H. Goss); Richmond Park (W. J. L.); Coombe Wood and Ripley (Stephens);

Boxhill (R. McLachlan); Dormans (M. Burr); Bisley (A. Ficklin, Junr.); near Effingham Station (W. J. L.); Oxshott (W. J. L.); Royal Horticultural Society's Gardens, Wisley (R. J. Wallis); Kew Gardens (W. J. L.).

Phasgonura viridissima, Linn. (August to October).—Strange to say I have no record for Surrey, since Stephens' record for Battersea Fields would no longer hold good.

Pholidoptera griseo-aptera, De Geer (August and September).—Near Bellagio, East Grinstead (M. Burr); Farnham, 1907, common (E. J. B. Sopp).

Metrioptera brachyptera, Linn. (August to October).—Wisley to Leith Hill (C. A. Briggs); near Ripley (Stephens); Coombe Wood (Stephens); Woking (W. J. L.); near Pyrford (W. J. L.); Oxshott Heath (W. J. L.); Black Pond (W. J. L.).

Of the eleven British representatives of the Acridiodea nine have been recorded from the county. *Mecostethus grossus*, Linn., may occur in bogs, and *Chorthippus elegans*, Charp., should certainly occur in some damp grassy spots.

Gomphocerus rufus, Linn. (August and September).—Boxhill (R. McLachlan); Leatherhead (M. Burr); Redhill (G. E. Frisby); Reigate (T. R. Billups); Oxshott (M. Burr); Bookham Common (W. J. L.); Battersea Fields, early in the nineteenth century, by Samouelle (C. W. Dale).

Gomphocerus maculatus, Thunb. (June to September).—Redhill (G. E. Frisby); Farnham and Frensham (E. J. B. Sopp); Devil's Punch Bowl, Hindhead (W. J. L.); Merrow Downs (W. J. L.); Blindley Heath, near Godstone (M. Burr); Boxhill (R. McLachlan); Wimbledon (Eland Shaw); Oxshott (W. J. L.).

Stenobothrus lineatus, Panz. (July to September).—Boxhill (C. A. Briggs); Leatherhead (M. Burr); Redhill (G. E. Frisby); Merrow Downs (W. J. L.).

Omocestus viridulus, Linn. (June to September).—Leith Hill (C. A. Briggs): Esher Common, Oxshott, Horsley, Byfleet Canal, Bookham Common, and Wimbledon Common (W. J. L.).

Omocestus rufipes, Zett. (August and September).—Leith Hill (C. A. Briggs).

Stauroderus bicolor, Charp. (July to November); a very common species.—Esher Common, near Ranmore, near Oxshott, Bookham Common, and Newlands Corner (W. J. L.); Horsley, and a garden in Upper Tooting in 1901 (R. South); Send (L. Rawes); Redhill (G. E. Frisby); Frensham Heath (A. Thornley); Boxhill (R. McLachlan); Queen's Cottage Grounds, Kew Gardens (G. Nicholson); Royal Horticultural Society's Gardens, Wisley (R. J. Wallis).

Chorthippus parallelus, Zett. (July to September); another very common species.—Oxshott Heath, canal near Byfleet, near Wisley, near Effingham Station, Bookham Common, Newlands Corner, and Ashtead Woods (W. J. L.); Boxhill (C. A. Briggs);

Redhill (G. E. Frisby); Richmond Park and Wimbledon Common (Eland Shaw); Queen's Cottage Grounds, Kew Gardens (G. Nicholson).

Tetrix subulatus, Linn.—Dormans, East Grinstead (M. Burr).

Tetrix bipunctatus, Linn. (all the year round, as the species hybernates in the perfect form).—Bookham Common, Esher Common, Oxshott, Ockham Common, Horsley, and Boxhill (W. J. L.); Byfleet (G. T. Porritt); Dorking (H. Guermonprez); Royal Horticultural Society's Gardens, Wisley (R. J. Wallis).

[Additions to this list will be welcomed.—Ed.]

ABERRATIONS OF THREE JAPANESE BUTTERFLIES.

By A. E. Wileman, F.E.S.

Zephyrus attilia subgrisea, ab. n.

Blackish with a faint purplish tinge; a black mark at end of cell, and indications of the darker under side markings; traces of a bluish white marginal line on each side of the tail. Fringes white. Under side greyish white; fore wings have a brown elongate spot at end of the cell, edged with white and enclosing a faint white line; a brownish, slightly oblique, postmedial band, outwardly edged by a broad white band; the area beyond the band is suffused with brownish and traversed by a submarginal series of white-ringed blackish spots, those towards costa smaller than those towards inner margin, the latter outwardly edged with orange; marginal line blackish; on the hind wings the brown and the white bands are similar to those on the fore wings, but the submarginal spots are less clearly defined outwardly; the outer margin below vein three is orange enclosing two black spots, that between veins two and three round. Expanse, 32–36 millim.

Collection numbers, 2017 and 2018.

Two specimens from Yamato, July, 1894.

Zizera argia insolita, ab. n.

♀. On the under side the spots on the outer area unite and form longitudinal bars between the veins, six on fore wing and eight on hind wing.

Collection number, 2019.

One female specimen (the type) from Ushigome, Tokyo, May 7th, 1895.

Local distribution.—Hondo, Tokyo.

Habitat.—Japan.

Argynnis aglaia gutta, ab. n.

♂. On the under side there are no silvery spots on apical area of the fore wing, and the silvery basal spots of the hind wing run together and form elongate blotches, a smaller silvery cloud at base of the costa. This aberration is very similar to that of *A. aglaia charlotta*, Haw.

Collection number, 2015.

One male specimen (the type) from Jozanke, Island of Yezo, August 13th, 1896. This is an aberration of the Japanese form of *aglaia* (*Argynnis fortuna*, Janson).

Local distribution.—Yezo, Jozanke.

Habitat.—Japan.

ON UNDESCRIBED EVANIIDÆ TAKEN AT KUCHING, BORNEO, BY MR. JOHN HEWITT, B.A.

By P. Cameron.

Megischus claripennis, sp. n.

Black, the outer orbits, four anterior tarsi and the middle tibiæ testaceous, the basal joint of the hind tarsi white; the greater part of the head rufo-testaceous, the vertex blackish, the outer orbits broadly white, the basal four joints of the antennæ of a paler testaceous colour than the head; the basal part of the second abdominal segment rufous. Wings clear hyaline, the nervures black. ♀. Length, 8 mm.; terebra 13 mm.

Vertex smooth, bare and shining to the commencement of the eyes, the rest finely closely transversely rugose; the three spines are distinct, triangular, acutely pointed, the anterior longer than the others and separated from them by a greater distance than these are from each other. Palpi dark testaceous. Prothorax smooth, a little longer than it is wide at the apex, becoming gradually wider from the apex of the basal fourth. Mesonotum shagreened, a transverse furrow near the apex; in front of this is a wider, more irregular furrow; behind it a deeper, pyriform fovea. Scutellum smooth, longer than wide, narrowed gradually to a sharp point at the base, which is bordered by a crenulated furrow. Metanotum closely reticulated, more finely and closely at the base than elsewhere. Propleuræ smooth, mesopleuræ aciculated, the metapleuræ irregularly obliquely striated. Abdominal petiole fully one-half longer than the rest of the abdomen, finely closely striated, of equal width and almost bare; the rest of the abdomen becomes gradually widened towards the apex, the top roundly curved, the lower part straight. Middle femora roundly dilated at the base. ♀.

Hind femora with a short acute tooth near the apex of the basal third and a thinner one near the base of the apical third; between these, on the basal half, are three small bluntly rounded teeth, and, on the apex, are four small teeth, which become smaller successively towards the apex.

Megischus palliditarsis, sp. n.

Black, the head rufo-testaceous, the orbits broadly white, the propleuræ and prosternum rufous, the base of second abdominal segment rufo-testaceous; legs rufo-testaceous, the posterior black, the base of middle tibiæ, their apex more narrowly, the middle tarsi, basal half of hinder (the basal joint to near the apex), and, to a less extent, the fore tarsi, white. Abdominal petiole about twice longer than the rest of the abdomen. Terebra almost as long as the body. Wings clear hyaline, the nervures and stigma almost white. Cephalic tubercles short, bluntly rounded. Pro- and mesothorax smooth and shining. Scutellum broadly triangular, the bordering furrows weakly crenulated. Metanotum strongly aciculated. Pleuræ smooth. ♀. Length, 7 mm.; terebra 6 mm.

Outer orbits lined with white. Mandibles pale, black at the apex. Basal joints of palpi black, the rest testaceous. Middle femora of uniform thickness. Pronotum about one-half longer than it is wide at the apex. There are only two teeth on the hind femora, a conical one behind the middle and a small conical one near the base of the apical fourth.

Megischus ruficollis, sp. n.

Black, the head and prothorax red, the face and oral region paler in tint, the outer orbits broadly and the basal half of the mandibles pale yellow; the basal four or five joints of the antennæ and the palpi pale testaceous. Four front legs pale testaceous, the femora darker coloured, the hinder black, the knees rufo-testaceous, the narrowed basal part of the tibiæ fuscous, the tarsi white; there are two large teeth on the femora, one near the apex of the basal third, the other near the base of the apical fourth; there are two short stumpy teeth at the base, four small, sharper ones between the large ones, the apical more widely separated from the others than these are from each other; there are three small ones beyond the apical large tooth, the basal longer and sharper than the others and touching the large one, the other two are stumpy, the basal larger than the apical. Wings hyaline, the stigma and nervures fuscous, the base of the stigma paler. ♂. Length, 7 mm.

Kuching, Borneo (John Hewitt, B.A.).

Face shagreened, closely transversely striated, more strongly on the sides; the vertex is more finely striated. The lower frontal spine is more sharply pointed than the others. Metanotum reticulated, sparsely so at the apex; the metapleuræ aciculated, the pro- and mesopleuræ smooth. Hind femora and abdominal petiole closely transversely striated. Scutellar fovea clearly defined, twice wider than long, of equal width, deep; the base bounded by a narrow smooth keel, the sides by a smooth wide one. Pronotum about one-fourth longer than it is wide at the apex. The cubitus is straight, extends to the apex of the transverse cubitus (which is straight) and forms a sharp angle with it.

Gasteruption erythrostomum, sp. n.

Black, the apex of clypeus, its sides more broadly than the centre, the apex of pronotum narrowly, the sides of the propleuræ more widely, the mark narrowed and rounded at the base, and a large triangular mark on the apex of the prosternum, rufous; the basal half of the prothorax tinged with rufous; the sides of the second to fifth abdominal segments of a darker rufous colour. The anterior coxæ, apex of middle pair, the four anterior trochanters, and the four anterior femora rufous, the middle coxæ black, except at apex, the middle femora black below, the four anterior tibiæ and tarsi white, the anterior tibiæ broadly black behind, the black band farther from the base than it is from the apex, the middle have the basal fourth and the apex narrowly white, the rest being black; the apex of the first joint of the middle tarsi narrowly and the other joints entirely above, are black; the hind legs black, a broad irregular band near the base of the tibiæ, and the first and second joints of the hind tarsi except at the base white. Wings hyaline, the nervures and stigma black. ♀. Length, 15 mm.; terebra 17 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head smooth and shining, the cheeks, lower part of front, face and clypeus densely covered with silvery pubescence. Ocelli placed in front of the hinder part of the eyes; they are in a curve; the hinder are separated from each other by a little greater distance than they are from the eyes; the latter distinctly converge below and are separated from the mandibles by less than the length of the antennal pedicle. Prothorax longer than the mesonotum with the scutellum, smooth. Base of mesonotum smooth, the rest stoutly transversely striated, the striæ more or less curved. Scutellum smooth, the apex with two or three striæ. Metanotum coarsely irregularly reticulated; the apex less strongly than the base. Pro- and mesopleuræ alutaceous, the depressed apex of the latter smooth and shining, the lower half of the depression striated. Metapleuræ reticulated, weakly at the base, more strongly at the apex. The first abdominal segment as long as the following three united. Antennal pedicle twice longer than wide; the third joint about one-quarter longer than the fourth.

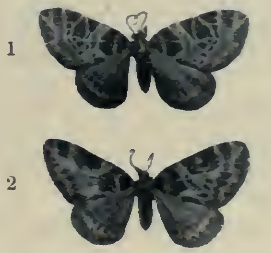
Evania trichiosoma, sp. n.

Black, the apical slope of the metanotum and sternum densely covered with white pubescence, the rest of the thorax, head and the petiole of abdomen more sparsely covered with long black hair; the apex of the fore coxæ, of the four anterior trochanters and the middle joints of the four anterior tarsi testaceous, the pubescence on the legs is longer and denser than usual; it is black, and on the under side of the coxæ is a dense covering of silvery pubescence. The long spur of the hind coxæ is about one-fourth of the length of the metatarsus, and is a little longer than the second joint; tibiæ and tarsi not spinose. Metasternal process strongly diverging. Face strongly striated, the striæ clearly separated; there are two striæ down the inner side of the outer orbits. Wings hyaline, very iridescent; basal abscissa of radius rounded, the apical is faint, oblique, rounded at the base. ♂. Length, 4 mm.

Ocelli in a slight curve, the hinder separated from each other by a slight but distinctly greater distance than they are from the eyes. Front stoutly striated, the striæ slightly oblique, distinctly separated. Malar space as long as the eyes. Puncturation on thorax strong, the punctures round and clearly separated; the upper part of propleuræ to shortly below the middle smooth; the base of the propleuræ with a row of punctures running from top to bottom. Occiput and cheeks strongly keeled, furrowed on the inner side of the keel, the furrow bearing some striæ. Antennæ stout, the third joint about one-fourth shorter than the following two united. Basal half of mandibles rufo-testaceous; the palpi testaceous.

AN INTERESTING ABERRATION OF *EUSTROMA RETICULATA* (Schiff).

By Louis B. Prout, F.E.S.



Eustroma reticulata. 1, normal; 2, aberration.

Eustroma reticulata is certainly one of the less variable of our "carpet moths," and the Rev. E. J. Nurse, Rector of Windermere, is to be congratulated on having bred, at the end of July last, the striking aberration of which the photograph is reproduced above. Knowing my interest in the Geometridæ, and especially in the variation of the Larentiinæ, our Editor has asked me to comment upon it. Really aberrant forms of this species must be exceedingly few and far between, and I have only notes of two. One is the large, dark example with the white lines—or some of them—reduced to a minimum, rather vaguely described by Hodgkinson (Entom. xxiv. 266). The other is in Mr. Sydney Webb's collection (from that of S. Stevens), and is an asymmetrical example, in which the dark colouring of the median area in the right fore wing is concentrated into a large costal blotch, a triangular inner marginal mark, and a slight mark between but distally to these, the rest of the area remaining pale. As will be seen, Mr. Nurse's example belongs to the same "phase of variation," and it is interesting that it is similarly asymmetrical. Almost the only other direction of variation known to me in this species is in the degree of approximation of the two central white lines at the costa. Sometimes these remain widely apart, sometimes they approach or even touch, sometimes they meet *before* the costa, enclosing a more or less ovate dark blotch (ab. *ovulata*, Borgmann).

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 32.)

Dysethia variegata, sp. n.

Fore wings ochreous, irrorated with purplish brown, and clouded with this tint on the basal half and on the area beyond postmedial line; antemedial line chocolate-brown inwardly edged with ochreous, angled and thickened on the veins, but extended to the costa; three chocolate-brown spots on the costa, pale edged, the first triangular with a small spot (discoidal) below, the lower end of the second curved outwards, the third small; postmedial line ochreous, sinuous, preceded by brown dots on the veins, commencing at the truncate end of the second costal spot; fringes brown, tips paler. Hind wings fuscous with an indistinct postmedial line, which is angled below the middle.

Expanse, 29–31 millim.

Collection number, 877 *a*.

Two male specimens from Arizan (7300 ft.), September, 1906, and August, 1908.

Perhaps this may prove to be only a geographical form of *D. bicommata*, Warren.

Dysethia taiwana, sp. n.

Fore wings dark purplish grey; three pale edged dark chocolate spots on the costa, the first small and triangular, the second large and curved, the third smaller than the first and somewhat quadrate; antemedial line dark chocolate, sinuous, not in evidence much above median nervure, slightly expanded on the inner margin; postmedial line sinuous, dark chocolate towards the inner margin, above which it is angled, indicated by chocolate dots from above vein two to the lower end of second costal spot; a diffuse, ochreous, transverse shade before the postmedial line. Hind wing fuscous with a faintly darker postmedial line, obtusely angled below the middle.

Expanse, 34 millim.

Collection number, 877 *b*.

A male specimen from Arizan (7300 ft.), August 18th, 1908.

Closely allied to *D. ocyptaria*, Swinhoe.

Lygranoa violescens, sp. n.

♂. Fore wings brown, suffused with violet-grey; costa ochreous brown; antemedial line brown, sinuous, evanescent towards costa; two brown spots on the costa, darker edged, a brown dot below the first, the second somewhat lunular; postmedial line brown, sinuous, outwardly edged with violet-grey; submarginal line ochreous, wavy, only distinct towards the inner margin. Hind wings dark fuscous brown. Under side of fore wings fuscous, ochreous on costal area, discoidal mark blackish; postmedial line dusky, pale edged; hind wings ochreous brown, powdered with darker, discoidal mark and wavy postmedial line blackish.

♀. Rather browner; the costal spots on fore wings darker; a diffuse, dusky, postmedial line on hind wings.

Expanse, ♂ 27 millim., ♀ 32 millim.

Collection number, 877.

One specimen of each sex from Kanshirei (1000 ft.), June 17th, 1906.

Allied to *L. fusca*, Butler.

Lobogonia bilineata, sp. n.

♂. Fore wings yellow ochreous, irrorated with black; ante- and postmedial line reddish, slightly expanded and rather darker on the costa, the former bent below costa, both inclined outwards on the inner margin; a black dot in the cell, an elongate one just beyond second line, and two dots before the outer margin; fringes ochreous, black below vein four and above vein six. Hind wings whitish ochreous, a dusky dot at end of the cell, and a dusky postmedial line; fringes marked with black at costa and anal angle. Under side ochreous irrorated with blackish; basal area of fore wings suffused with blackish; postmedial line blackish, diffuse towards the costa.

Expanse, 30 millim.

Collection number, 871.

A male specimen from Arizan (7300 ft.), September 13th, 1906.

Allied to *L. ambusta*, Warren. The outer margin of hind wings not angled at vein four.

Lobogonia aculeata, sp. n.

♂. Fore wings whitish ochreous with a few black scales chiefly on the outer half of the wings; two black triangular marks, the apex of the second extended to a longitudinal black mark just beyond lower angle of the cell; a faint brown line from lower end of each costal mark to the inner margin; an almost straight submarginal band composed of scattered black scales; a black dot at end of the cell, one on costa before apex, and one on the outer margin between veins five and six; fringes black, except at apex, vein four, and just above the tornus. Hind wings rather paler, freckled, especially on outer area, with fuscous brown; medial band black-brown, straight from inner margin to the cell; fringes marked with black; outer margin strongly angled at vein four.

Expanse, 22 millim.

Collection number, 872.

A male specimen from Kanshirei (1000 ft.), April 22nd, 1906.

Near *L. conspicuata*, Leech.

Cidaria arizana, sp. n.

Fore wings velvety black; subbasal line whitish, almost straight; nervures marked with whitish; antemedial and medial lines whitish, wavy, approaching each other below the middle, enclosed space partly filled in with whitish, flecked with ochreous on the veins; postmedial whitish, projected inwards along vein two almost to the medial line, and bilobed about middle; the space between postmedial and whitish wavy submarginal line is, except towards costa, whitish dusted with blackish, and flecked with ochreous on the veins; marginal line whitish, fringes whitish inclining to ochreous at base, traversed by a blackish line, and chequered with blackish at the tips. Hind wings fuscous; postmedial line darker, outwardly edged with whitish; submarginal line whitish, macular.

Expanse, 50 millim.

Collection number, 835.

A female specimen from Arizan, September 14th, 1906.

Closely allied to *C. mactata*, Felder; perhaps may be a local form of that species.

Cidaria interrupta, sp. n.

Fore wings ochreous brown, speckled with darker brown; basal patch blackish, limited outwardly by an angled white line; medial band blackish, edged with white, interrupted by veins two, three, and four, the portion between two and three completely separated, forming an oval spot, the costal and inner marginal portions enclose pale edged black marks; some blackish interneural marks between basal patch and medial band; submarginal line white, indented on costal area where it edges two blackish marks, thence represented by more or less distinct lunules; a blackish spot on the outer margin from apex to vein four, inwardly edged by an irregular, curved, white line; some blackish marks between the spot and the inner margin; fringes ochreous brown, darker mixed at base. Hind wings whitish brown, suffused with fuscous except on the costal area; postmedial line pale, wavy, not extending to the costa, preceded by some blackish marks on the inner margin; submarginal line pale, only traceable from inner margin to vein four.

Expanse, 46 millim.

Collection number, 836.

One male specimen from Daitozan (8500 ft.), September 19th, 1906.

Near *C. melancholica*, Butler.

Xanthorhoë costata, sp. n.

Fore wings whitish, with several obscure, wavy, fuscous, transverse lines; basal patch brown, outer edge almost straight, but indented above middle; medial band brown, extending only from costa to vein five, and contracted just above that vein; submarginal line white, only distinct near the costa, where it traverses an obscure band-like shade which is brownish on the costa. Hind wings whitish, without markings. Fringes white chequered with brownish.

Expanse, 24 millim.

Collection number, 825.

A female specimen from Daitozan (8500 ft.), Sept. 11th, 1906.

In general appearance this insect resembles *P. biplagiata*, Warren.

(To be continued.)

ON TWO UNDESCRIBED GENERA AND THREE NEW SPECIES OF ICHNEUMONIDÆ FROM BORNEO.

By P. Cameron.

Hemiphatnus, gen. nov.

Radius and cubitus almost united at the areolet, the only (the basal) transverse cubital nervure being not much longer than thick; the recurrent nervure is received shortly beyond it; the transverse median nervure is received behind the transverse basal. Transverse cubitus in hind wing broken near the top of the posterior third. Metanotum smooth, with one transverse keel near the base; the spiracles longish oval. Basal two abdominal segments long and slender, the first more so than the second. Thorax about four times longer than wide, the parapsidal furrows deep; the scutellum rounded, not raised above the mesonotum, head wider than the mesonotum, obliquely narrowed behind. Clypeus separated from the face, its apex bluntly rounded. Antennæ long and slender, not ringed with white, the basal joints of the flagellum long. Claws small.

The type of this genus is a much more slender insect than the majority of the Mesostenini, especially as regards the abdomen and the antennæ. Characteristic also is the very smooth body, including the metanotum. Of the Malay genera, its nearest ally seems to be *Lactolus*, which, however, has the thorax striated, the antennæ thicker, and the areolet is much larger and closed at the apex.

Hemiphatnus nigripalpis, sp. n.

Entirely smooth and shining, yellow; the antennæ, palpi, mandibles, middle of front broadly, the occiput, except for a triangular spot (the narrowed end below) at the eyes, the pronotum except narrowly at the apex, a large triangular mark on the upper half of the propleuræ, its narrowed end at the base, the mesonotum, the metanotum at the base behind the keel, the extreme base of the first abdominal segment, black; the apical three-fourths of first, second abdominal segment, the basal half of the third, more than the basal half of the fourth, and the other segments above, brown. Wings hyaline, the stigma and apical nervures fuscous, the basal nervures black. ♀. Length, 13 mm.; terebra, 2 mm.

Kuching, Borneo (John Hewitt, B.A.).

Legs pale yellow; the four anterior femora black behind, the apices of all the tibiæ (almost the apical fourth), the extreme base of the posterior and the tarsi, black; the hind femora brownish black; the tibiæ and tarsi shortly spinose. Hind coxæ about four times longer than thick. The furrow on the lower part of the mesopleuræ is roundly curved and smooth. The brown colour on the basal abdominal segment is blacker than it is on the others.

Talorga, gen. nov.

Wings without an areolet, the transverse cubital nervure short. Radial cellule long, reaching to the apex of the wing, the radius issuing from the middle of the stigma. Transverse median nervure interstitial. Transverse cubital nervure in hind wing broken shortly below the middle. Eyes large, converging below, extending close to the base of the mandibles. Clypeus not separated from the face. Temples short, the occiput not margined. Parapsidal furrows distinct. Scutellum large, the sides distinctly keeled. Metanotum long; there is a distinct longish areola; the spiracles minute, round. First abdominal segment slender, roundly curved above. Legs longish, the tibiæ and tarsi thickly spinose; the two hind calcaria long, the longer fully one-third of the length of the metatarsus. Claws not pectinated. Face aciculated, raised in the centre. Cheeks smooth. Occipital margin entire. First abdominal segment with lateral keels which extend to the tip. Abdominal segments two to four more than twice longer than wide. Areola joined to the base of the metanotum by a keel; sharply pointed at the base, becoming gradually widened to shortly beyond the middle; there is a rugose area, as long as wide at its apex; the sides, outside the spiracles, are bounded by a keel. Mandibles short, of equal width, the apex broad, bidentate. The last joint of the hind tarsi is shorter than the third, as long as the fourth.

Belongs to the Tryphoninæ, tribe Mesoleptini. Without a female it is not easy to settle its exact relationship, but the very large eyes, distinct parapsidal furrows, strongly keeled scutellum, and strongly spined tibiæ and tarsi appear to be characteristic features.

Talorga spinipes, sp. n.

Black, shining, the metathorax finely, closely punctured, the basal segment of the abdomen finely, closely striated; the mandibles, palpi, and legs rufo-testaceous; the base of the coxæ broadly infuscated; the wings hyaline, the stigma and nervures fuscous. Flagellum of antennæ densely covered with longish fuscous pubescence; the apical joints are fuscous. Ventral surface of abdomen testaceous. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

Palmerella longispina, sp. n.

Black, the basal two joints of the flagellum of antennæ, the fore legs, except the coxæ and trochanters, fuscous, the middle femora and tibiæ of a darker fuscous colour, the palpi testaceous, the third joint of the hind tarsi except at the base, and the fourth whitish; wings hyaline, the nervures and stigma black. Face closely, strongly punctured; between the antennæ is a smooth, shining plate, widest in the middle, from where it becomes gradually, obliquely narrowed to the base and apex. Occiput smooth and shining. Thorax more coarsely punctured than the head, the scutellum much more coarsely punctured than the rest of it; it is sparsely haired; on the metanotum the punctures run into reticulations, as they do also on the metapleuræ. Coxæ closely, strongly punctured, the under side of the hinder densely covered with white pubescence. Pleural furrow deep, curved, crenulated. Genitalia large, white. ♂. Length, 6 mm.

This species is smaller than *P. nigra*, Cam., the type of the genus; the two species may be separated thus:—

A square white mark on centre of face above, the front with a distinct longitudinal keel, the basal segment of abdomen distinctly punctured. No plate between the antennæ. Length, 8–9 mm. . .	*nigra.*
Face immaculate, the front without a distinct keel, the basal segment of abdomen smooth. A smooth, angled plate between the antennæ . . .	*longispina.*

NOTES BY THE WAY.

Excepting a few small groups of insects, no museum, public or private, in this country can compete in the extent of its collections with that at Cromwell Road, which has recently made such strenuous and entirely effectual efforts under the jurisdiction of Mr. C. O. Waterhouse, I.S.O., to bring the valuable material possessed by it up to date. We are delighted to find that, at the expiration of his term of office, Mr. Waterhouse is voluntarily continuing his good work in the Public Insect Gallery. Another vacancy has been caused by the deplorable nervous breakdown of Mr. Heron; but both posts are already filled—by Mr. Edwards, who is taking charge of the British Diptera, and Mr. Blair, to whom Mr. Gahan has been obliged, by the press of his official business as Assistant-in-Charge of the Insect Department, to very largely resign his work on the Coleoptera. The new administrational note is, however, struck by the acquisition of three Permanent Assistants; and our honoured Editor has also consented to join the good work as a Special in his particular branch.

No man has time, and few have the inclination, to work the whole of Entomology. Literature is so vast nowadays that there will never be another Westwood. Indeed, it is quite as much as the average stay-at-home man, working his own branch, can do to follow the researches of various scientific missions sent out by those in authority (that is to say, with spare cash) to more or less remote and entomologically unexplored districts. The nearest one now in progress is to be completed during the coming summer, and the results will shortly appear in the 'Transactions of the Royal Irish Academy.' This is a general survey of tiny Clare Island, off the west coast of Mayo, battered by every storm thundering three thousand miles across from New York, till it has become so erosed as to be perpendicular for two thousand feet or so on its north-west front, and thence falling away to sea-level on the south-east, where is the only scrap of wood, stunted and wind-swept, on the island. It is an unproductive spot, with a scanty and not very interesting fauna; the insects are rare, and no peculiar species have yet been reported. Much interest, nevertheless, attaches to so remote a spot, and the results, taken in conjunction with the recent reports from Lundy in a contemporary, from the Isle of Wight by Mr. Morey in 1908, and from the Scottish islands, will add considerably to our knowledge of insular selection.

The entirely distinct characters of the Entomological Club and the Entomological Society are most happy in so far avoiding friction as to render each reciprocally useful. At the annual gathering of the former, under Mr. Verrall's ever-genial presidency, at the Holborn Restaurant on the 17th ult., a record number of guests was assembled, extending to about eighty suppers. Quite a novel situation was freely discussed; never before, we believe, has a president-elect of the Society died before entering upon his office, and the question arises who should fill his place. In view of the forthcoming most important International Entomological Congress at Oxford, which will fall into the term of this presidency, it is quite necessary that our leader should be of both international reputation and considerable resources, in order to fittingly uphold the prestige of our premier society. Equally worthy as are a few of the other names suggested, we have not the slightest hesitation in stating that one is pre-eminent in both these respects—the Hon. Walter Rothschild.

C. M.

NOTES AND OBSERVATIONS.

Chœrocampa nerii at Eastbourne.—While staying at Eastbourne in August last, word was brought to me that a specimen of *Chœrocampa nerii* had been taken by one of the bathers off the pier-head, but I could get no very clear account of it at the time. Recently, however, I have got into touch with the actual captor, Mr. Arthur C. Hillman, of Sussex Gardens, Eastbourne, to whom I am indebted for the following detailed account of its capture. He writes as follows:—"From memory it was on Monday, 15th August last, at about 7.30 a.m., that I was bathing in the sea from the pier-head; I was a few yards out when my attention was drawn to a leaf-like object floating on the water at a short distance from me. I swam to it and found a fine moth; it was alive, its wings being raised up over its back, and it readily clung to my hand; it did not, however, make any attempt to fly, and after I landed with it on the pier a close examination showed that it was in a very feeble condition. I took it home and kept it in a cardboard box in which some moist brown sugar was placed. At night I removed the lid of the box, and next morning found the insect on the window-curtains, it evidently having revived. On the following Wednesday or Thursday I handed it to my brother-in-law, Mr. Bertram Earp, who is a very keen entomologist, and who identified it as *Chœrocampa nerii*. The specimen is now in his collection."—ROBERT ADKIN; Lewisham, January, 1911.

AMPHIDASYS BETULARIA ab. DOUBLEDAYARIA IN ESSEX.—In the 'Entomologist' for last year, at p. 204, the Rev. W. Claxton records the occurrence of a female example of this aberration at Navestock, and remarks that it "is perhaps a record for Essex"; so it may be interesting to him and others to learn that in this corner of the county the black variety is by no means uncommon, indeed, it is now as frequent as the type. I came to this neighbourhood in 1886, and for a few years after the larvæ, usually obtained every year, of this insect produced typical specimens, although many of them were often very dark—almost intermediate between the type and *doubledayaria*—and they have become darker and darker every year, and at the present time nearly half the moths reared from the wild larvæ I obtain emerge as *doubledayaria*. A few years ago one of my children found a large female *doubledayaria* sitting on my front door-step, and from her I obtained a quantity of ova. When they hatched, the young larvæ were sleeved upon an ash-tree in my garden, and from these the following year I bred over one hundred moths, more than two-thirds of which were the black variety. The wild larvæ seem to have no particular choice of food, for I have beaten them from every kind of tree and bush, and on several occasions from mugwort, when hunting for larvæ of *Eupithecia succenturiata* at night.—GERVASE F. MATHEW; Dovercourt, Essex, January 14th, 1911.

CORRECTIONS IN NAMES OF THREE SPECIES OF PHYTOPHAGA.—The late Mr. Jacoby in Trans. Ent. Soc. 1897, p. 260, described a *Hermæophaga* as *smithi* from the West Indies. This name has been previously used in the 'Biologia,' Supp. p. 262, for a Mexican form. In his second collection Mr. Jacoby had altered the name-label of the West Indian form to *insularis*, Jac. In P. Z. Soc. 1903, p. 284, he describes *Doryphora æneofasciata* from Columbia, on page 291; he inadvertently uses the same name for a Peruvian form. In his copy of the published paper (in my library) the latter name is changed by him to *chalybeofasciata*; on page 287 he uses the name *Doryphora sanguinipennis* for a form from Brazil; he had previously used this name (Entom. 1895, p. 189) for a form from Venezuela; the Brazilian species should be altered to *sanguipennis*.—C. BOWDITCH; Brookline, Mass., U.S.A.

ABNORMAL EMERGENCE OF COREMIA DESIGNATA.—At the beginning of last September I received a batch of ova of this species from the South of Ireland. They hatched on the 14th of the month, and fed up well on cabbage. The breeding-cage was kept in an open shed out of doors, facing the north-east. On December 23rd I was surprised to find four of the moths had emerged, on the 25th another appeared, on 31st another, and another on January 10th. After this I brought the breeding-cage indoors. I cannot understand why these moths should have thought fit to come out at such an unseasonable time of the year. We had some sharp frosts between November 16th and 23rd; then the weather became mild until the 29th, when it was frosty and cold again for a few days, but from December 3rd to the 25th it was more or less mild and damp, and so I suppose this accounts for it.—Gervase F. Mathew; Dovercourt, Essex, January 19th, 1911.

Unrecorded Occurrences of Euvanessa antiopa.—Describing the village of Camberwell, where Robert Browning's grandparents settled, and in 1782 their eldest child was born, the late Professor Hall Griffin writes: "The square embattled church-tower . . . stood at the base of the pretty tree-clad slopes of Denmark Hill, Herne Hill, and Champions Hill, amid hedgerows and oak-trees, surrounded by well-stocked pastures and their overshadowing willows and flowers and fruit-trees, which were the haunt of the butterfly. Was not the Camberwell Beauty famous? Indeed, when the Browning household moved to Camberwell, the parish authorities had just been busy 'apprehending' the too numerous caterpillars, and in a single season had secured some four hundred bushels. A generation later, in 1810, Dame Priscilla Wakefield, in her 'Perambulations,' described Camberwell as a pleasant retreat," &c.*

In the hope of discovering the authority for this entomologically amazing statement, I wrote to Mr. Minchin to ask if Professor Hall Griffin had left any note to indicate the sources thereof. Mr. Minchin, however, could throw no additional light on the problem, so at his suggestion I turned to Mrs. Wakefield's 'Perambulations in London,' published in 1814, on the off chance of finding an allusion to this plague of *Antiopa* larvæ! But Dame Priscilla is silent on the subject. "Camberwell is a pleasant retreat for the citizens who have a taste for the country, whilst their avocations call them daily to London"—that is all the information vouchsafed by "Yours affectionately, Edwin," the imaginary writer of her Letter xxix.

But the mystery is explained to some extent in 'Old and New London; the Southern Suburbs,' vol. vi. p. 279, by Edwin Walford, where, after expatiating on the rural charm of Camberwell, the author transcribes a Vestry Minute, to the effect that in 1782 caterpillars so abounded in the parish that the overseers spent £10 in "apprehending" them, at the rate of sixpence a bushel; the caterpillars being cited as "dangerous to the public in general"; and immediately afterwards Walford mentions that the Camberwell Beauty, "the delight of entomologists, is still one of the finest butterflies of the season . . . It was abundant when Camberwell was a straggling parish." Thus, setting aside the question of the normal abundance of *Antiopa* in Camberwell, or anywhere else in Britain at this time, it is clear that Browning's latest biographer read the same paragraph, and jumped to the conclusion that the caterpillars "at sixpence a bushel" were those of the insect he introduces to emphasize the rusticity of the then suburban London.

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* 'The Life of Robert Browning' . . . By Professor Hall Griffin. Completed and edited by Harry Christopher Minchin. Methuen & Co., Ltd., 1910.

Meanwhile, one would like to know to what pest the entry in the Vestry Minute really refers. But unfortunately the record is no longer available on the spot, for, as the present Vicar, the Rev. F. F. Kelly, kindly informs me, St. Giles' Church was entirely destroyed by fire in 1841, and only the register-books of births, deaths, and marriages were saved. Was it *Stilpnotia salicis ?* Perhaps some reader of the 'Entomologist' can supply the missing data?—H. Rowland-Brown; Oxhey Grove, Harrow Weald, January 10th, 1911.

CAPTURES AND FIELD REPORTS.

Scarcity of Wasps in the Chester District.—Wasps in 1910 were extraordinarily scarce in this part of Cheshire. Even in a woodland tea-garden, a few miles up the river Dee, the waitresses told me they had not seen one, although the cakes and other sweets attract the insects from far and near. Queen wasps in spring seemed hardly up to their usual numbers, and I am not aware that any rewards are offered here for their destruction.—J. Arkle; Chester.

Phtheochroa (Argyrolepia) schreibersiana, Fröl., in Gloucestershire.—I am pleased to be able to record the capture of this very local *Tortrix* in the Forest of Dean on June 23rd, 1910. I netted two specimens flying in the afternoon sunshine about four o'clock amongst some elm trees growing near water. Both were rather worn, and therefore I did not realize what a prize I had at first, but upon submitting one of the moths to Mr. Edward Meyrick, F.E.S., he at once referred it to this species. Previous records appear to be confined to Suffolk, Cambridge, and Hunts.—C. Granville Clutterbuck, F.E.S.; Heathside, Heathville Road, Gloucester, December 21st, 1910.

Lepidoptera in the Portsmouth District.—The only other working entomologist within some distance of Portsmouth would appear to be the Rev. Tarbot, of Fareham, and as I am only new to the neighbourhood, I have taken care only to mention those insects which he has not previously captured here, unless possibly it may be in some isolated instance. The capture of a freshly emerged specimen of *Caradrina cubicularis* at ivy on October 17th last might be worth recording, as this would seem to be an exceptionally late date for this species. The following few captures made during the past season might also be of interest, as the majority of the species seem to be more or less new to the district; they were all made in a small wood and marsh stretching for about half a mile below Purbrook, a small village about six miles from Portsmouth, on the main Petersfield road. The gas-lamps from Portsmouth stretch out as far as Purbrook, the last one being situated on a bridge at the edge of the wood, and this light proved especially attractive, a total of no less than ninety-five species being taken there; this number would, I am sure, have been largely augmented had I not been unavoidably absent from home for the greater part of July and August and the whole of May and September. At my first visit to this lamp on

June 1st on my return from Scotland, a very fine *Notodonta trepida* was taken, also *Drepana hamula*, among a host of commoner things, during the course of the evening. Other insects taken during the year were:—*Calligenia miniata* (two), on August 11th; *Lithosia lurideola* and *L. griseola*, which were in the greatest abundance from my return home on July 25th till the middle of August, and shared with *Noctua plecta* and *N. rubi* the distinction of being by far the commonest insects at this particular spot; *Drepana hamula*, one on July 27th, and one on August 15th; *Pterostoma palpina*, one on June 8th, and one on August 12th; *Luperina cespitis*, one taken by a village lad on September 5th during my absence; *Triphæna interjecta*, one on August 6th; *Dianthœcia cucubali*, one on June 11th; *Petasia cassinea*, one on November 26th; *Ennomos erosaria*, one on 5th and one on October 9th; *Geometra papilionaria*, a very fine male on July 26th, a bright moonlight night, the insect having to be chased across two fields before its final capture; *Acidalia imitaria*, one on August 13th; *Numeria pulveraria*, one on June 7th; and *Cidaria silaceata*, not uncommon between August 3rd and 15th. Many other good things were captured, but seem to have been taken more or less commonly in the neighbourhood of Portsmouth before. From the middle to the end of June *Hepialus hectus*, *Xylophasia hepatica*, *Apamea gemina*, *Erastria fuscula*, and *Toxocampa pastinum* were to be taken not uncommonly dusking in the rides of the wood, but it was difficult to pick out the better insects from the hosts of common things that were flying everywhere; *Nudaria senex*, too, was fluttering about in fair numbers among the tall reeds and grasses in the marsh at the end of July and beginning of August. Single specimens were taken of *Xylophasia scolopacina* on July 25th, *Tethea retusa* on August 12th, *Hadena genistæ* on June 27th, *Angerona prunaria* on June 25th.

Sugaring was a complete failure throughout the year, except for two nights, *viz.* June 25th and 27th, when every patch was simply alive with insects, in a drizzling rain and with a strong "sou'wester" blowing. On these two nights, *Leucania pudorina*, *L. comma*, *Xylophasia sublustris*, *X. hepatica*, *Apamea gemina*, mostly of the var. *remissa*, and *Mamestra anceps* were all fairly common, together with some beautiful varieties of *Miana strigilis* and *Noctua festiva*. Collecting by day did not produce very much worth recording; butterflies of any sort were few and far between, and the Geometers beaten from the hedgerows were mostly those that seem common to the whole district; *Epione advenaria* was perhaps more abundant than usual, and the same thing applies to *Bapta temerata*; *Tephrosia extersaria* was found on an oak-trunk on the 4th of the month, and *Lobophora hexapterata* at rest with extended wings on the garden paling on the 6th. With regard to larvæ, *Diloba cæruleocephala* was simply swarming on the hawthorn hedges at the beginning of June, and the moths appeared in corresponding numbers round the lamps throughout October; full-fed larvæ of *Arctia caia* were frequently picked up crawling across the paths, and a considerable number of *Odonestis potatoria* were found sunning themselves on the long grass under the hedgerows. It now only remains to mention that *Pœcilocampa populi* has been not uncommon during the past month around the lamps in Fareham.—LESLIE H. MOSSE ROBINSON; 2, Margaret Villas, Portchester, December 28th, 1910.

COLLECTING AT KENDAL (WESTMORLAND).—Continuing my notes (*vide* Entom. vol. xliii. p. 252) on the season's work in the Kendal neighbourhood, I am able to report considerable activity amongst our local lepidopterists during the latter half of the year 1910, accompanied by the acquisition of a wider knowledge of the habits of many species, and by the encouraging addition of one or two fresh names to our list. For several reasons, but chiefly owing to the broken state of the weather, collecting throughout July was of a more or less desultory nature. Several expeditions were made between July 3rd and 9th to some high-lying marshy ground in quest of *Argynnis selene*, but the resulting captures were disappointing. Three journeys for a total of nine specimens, and this in a haunt where it has been found some years literally in hundreds. *Larentia cæsiata*, showing considerable variation, was common in the same neighbourhood, resting in the daytime on the boulders and rock-faces, sometimes a dozen or more in one sheltered corner. Generally they were pretty active and rose quickly at one's approach. Some were stalked till they came to rest on the heather, and invariably these were found to be quite fresh—the worn insects remaining on the rocks, more reluctant to rise. Males of *Phothedes captiuncula* were taken freely in early July resting on the flowers of ox-eye daisy. One specimen was reported as early as June 17th. Females of *Nemeophila russula* were still to be taken in good condition on July 17th, though males of the same species had been netted fully a month earlier. On the 18th, fifteen very young larvæ of *Dicranura furcula* were discovered on sallow—all on the lower branches quite close to the ground. The young larva sits on a silken pad in the centre of the upper side of the leaf and is easily seen. In several cases the empty egg-shell was observed on the *under side* of the same leaf. On July 19th, my friend, Mr. G. Holmes, reported taking some nice *Aphantopus hyperanthus* and *Argynnis aglaia*, one of the latter being a small dark female. July 27th saw two more *Notodonta dictæoides* in the pupa-cage, an interval of eleven days having elapsed since the last emergence. They vary in the depth of chocolate coloration on both thorax and wings. I have one bred specimen, a male, quite grey and hoary. On the night of the 27th two *Noctua dahlii* turned up at sugar. About this date *Melanippe sociata* began to appear, and my series includes some with a very distinct and almost black median band, strongly marked, as in *M. galiata*, and without the customary indefiniteness of *M. subtristata*.

August 1st broke out fine and sunny, and we spent the morning amongst *Erebia æthiops*, which we found to be just beginning. Only one female was netted; they are usually a good week later than the males. This species varies greatly from year to year in the matter of size. On August 2nd several good examples of *Anaitis plagiata* were netted. Larvæ of *Phalera bucephala* were very abundant in early August—birch, sallow, oak, and lime being apparently the favoured (?) trees. August 11th saw appearing in the pupa-cage some fine imagines of *Cirrhœdia xerampelina*, bred from larvæ found under moss on ash-trunks in May. On the 14th I took a grand series of *Chrysophanus phlæas* on the border of the "moss." Females were in splendid order, but the males had evidently been some time on the wing and selection was necessary. During the day the heather-bloom seemed to be a great attraction, but towards evening, in an adjacent cornfield, numbers were observed resting, with wings opened towards the waning sun, on the ripe heads of the corn, and a pretty picture they presented dotted about the field like so many brilliant flowers. With a solitary exception all were head downwards. The following day I found ten nearly full-grown larvæ of *Vanessa cardui* on nettle. These were sleeved on a bunch of the food-plant, and allowed plenty of light and air. The resulting imagines lack nothing in size, and form a fine series of dark examples, a great contrast to those I have reared from time to time on thistle. All the usual dark markings appear to be somewhat extended, the series of spots on the lower wings run together to form a band, and on the fore wings the marginal black encroaches on the pink in the form of a smudge. In every one the nervures are thick and dark. Half a dozen full-fed larvæ of *Notodonta ziczac* were found on sallow, numerous *Hylophila prasinana* on oak, and *Selenia bilunaria* on mountain-ash. Imagines of *Cidaria testata*, *Coremia unidentaria*, *Eubolia limitata*, and *Crocallis elinguaria* appeared at dusk; whilst after dark the heather-bloom or the moss attracted *Noctua xanthographa*, *N. umbrosa*, *N. rubi*, *Hydræcia nictitans*, *Triphæna pronuba*, *T. orbona*, and freshly emerged *Xanthia fulvago*. With the exception of the last, a very sluggish insect, most of the Noctuæ are shy, and fly off or drop as one approaches. A net is a useful accessory when working heather, and prevents the ultimate escape of many an insect. Sugar and the ragwort flowers in the vicinity of the heather-bloom were entirely neglected. One specimen of *Epione apiciaria* was netted about 10 p.m., and on subsequent evenings several more were found sitting quietly on the lower leaves of the sallows, and generally well under the bushes. When disturbed, they fluttered gently to an adjacent leaf and settled down again. Until this season we have been accustomed to look upon *E. apiciaria* as a rarity in our district, but this capture only proves what one often suspects, that many so-called rarieties have gained the reputation simply through our ignorance of their habits. *Hypsipites sordidata* swarmed around the sallows after dark, but were mostly far worn.

On the 18th I paid a visit to an old haunt of *Pararge megæra*, a rapidly disappearing species with us. On this occasion, fortune, represented by the sun, frowned. I certainly saw one *megæra*, but before I could dismount from cycle and unfurl the net, it had disappeared, and with it the solitary gleam of sunshine. Heavy clouds were quickly gathering, but being in the neighbourhood, I risked a probable wetting for the sake of hunting for larvæ of *Cucullia asteris*. An hour's search produced two! Last year I found thirty in half the time. On the 21st we started larvæ-beating in earnest, determined this year to give the birches on the mosses a thorough working. Ten *Notodonta dictæoides* (some very small, the largest only half an inch in length), six *Geometra papilionaria*, one *Acronycta leporina*, and numbers of young *Notodonta dromedarius*, *N. camelina*, *Drepana* *falcataria D. lacertinaria*, *Cabera pusaria*, and a few small *Amphidasys betularia* comprised the first morning's bag. The following day added seven *N. dictæoides* and nine *G. papilionaria*, together with the other commoner species. Solitary trees proved best for *N. dictæoides*, although an outstanding lower branch of the larger birches (growing often in groups) occasionally held them. *G. papilionaria* at this date were very small and difficult to see on the tray. Several young larvæ of *N. camelina* were puzzling, inasmuch as the usual plain green dorsal surface was studded with small shining black tubercles, and the head was figured with two conspicuous eyelike marks. Three of these larvæ were kept separate from the rest, and produced later the *pink* form of the adult larva. Throughout August and September we beat the birches, with the result that a goodly quantity of larvæ were taken. *Notodonta dictæoides* and *Geometra papilionaria* were neither of them uncommon; *Notodonta dromedarius* and *Lophopteryx camelina* were abundant, but more than half of them "stung." *Drepana lacertinaria* was this year more plentiful than *D. falcataria*, though the converse is usually the case. *Cabera pusaria* was everywhere, showing four or five distinct forms. *Cidaria corylata* we added in late September, one of the larvæ being a pretty coral pink, bright on the ventral surface, somewhat paler on the back. Some of the *Geometra papilionaria* on September 18th were surprisingly big, and showed quite a lot of green on the sides. If not sleeved outside for the winter, they require to be fed as long as a vestige of green remains on the trees, and when leaves fail, they eat the birch-catkins readily. By now, November 18th, my larvæ have fixed themselves firmly to the twigs, appear to have shrunk considerably, and have assumed the duller brown tint of the birch bark.

Two enthusiastic entomological friends, Messrs. A. Graveson and T. Smith, sugared persistently throughout August in the hope of arousing again *Aplecta occulta*, examples of which they had been fortunate enough to take last season. But "sugar" during August was this year disappointing, and a solitary *Orthosia suspecta* was the only capture worth noting. On heather-bloom, however, they secured a nice series of *Noctua glareosa*. One night they reported seeing quite a number of toads sitting boldly on the heather-tops, obviously waiting for the supper which the winged visitors should provide—no wonder some species are becoming scarcer! Four imagines of *Ennomos alniaria* were bred on August 23rd from larvæ beaten from birch on the moss in May. About this date, *Neuronia popularis* and *Charæas graminis* were common on the street-lamps. The weather of the latter half of August was impossible, and outdoor work came to a standstill. September opened fine and the prospect improved. *Polia chi* was again abundant. The lighter forms are well protected on our local limestone, but on the blue-stone walls of the Windermere district they are conspicuous and unmistakable. I have never taken the var. *olivacea* here. On September 3rd a number of larvæ of *Spilosoma fuliginosa* were discovered on the roadsides, and they are now in hybernation. On the 7th a much worn female of *Calocampa solidaginis* was captured on heather-bloom. This is an insect new to the district, but will, in all probability, be found commonly if looked for at the right time. The same night a solitary male *Oporabia filigrammaria* was netted flying over the heather. *Tapinostola fulva* flew commonly over the marshes in the evening, 5.30–7 p.m., but was beginning to look worn by September 15th. When they settle, they go right down to the roots of the grass and sedge, and are extricated only with difficulty. An odd specimen of *Celæna haworthii* was taken, but no *Agrotis agathina*, although the latter occurs. A considerable number of a long white-striped green larva were beaten from Scots fir (*Thera variata ?*), but nearly all were "stung." At the same time, larch yielded the variously tinted larvæ of *Odontopera bidentata*, several *Macaria liturata*, and numbers of *Eupithecia lariciata*, the latter in both forms, the green, however, greatly predominating.

October 4th saw the opening of the "ivy" season. Species noted were *Cerastis vaccinii* and *C. ligula*, both common; *Xanthia circellaris* and *Miselia oxyacanthæ*, showing signs of wear; one *Plusia gamma*; and one *Orthosia lota* – not a brilliant start! On the 6th *Orthosia macilenta* and *Phlogophora meticulosa* joined the abovementioned species. *Cidaria miata* was flying commonly but somewhat *passé*. *Oporabia dilutata* was also in evidence, but the males were none too fresh. Several larvæ (*sambucata ?*) were found suspended by short threads from the ivy-leaves. On October 10th we paid a visit to the oak-wood for *O. dilutata*. The males began to fly at 8.30 p.m., and several freshly emerged females were taken from the oak-trunks and from the heads of grass-stems. It would almost appear that a great number of thread-spinning larvæ allow themselves to drop, when full-fed, direct to the ground rather than descend by way of the tree-trunk; so many insects may be found drying their wings on grass-stems many yards away from the tree-trunk. The same night we took the first male *Himera pennaria*, although this species did not become really plentiful till October 30th, and by November 5th it had disappeared. One specimen each of *Cheimatobia brumata* and *Hybernia defoliaria* were noted on October 10th. October 20th, a bitterly cold night, with strong north wind, so wild and seemingly unsuitable that I hesitated to ask my friends to accompany me, I went down at dusk to examine the ivy-bloom. Moths swarmed! Moreover, they disdained to take advantage of the sheltered flowers, but seemed to prefer the top of the wall, where they were blown about so forcibly by the wind that selection of specimens was well-nigh impossible. *Scopelosoma satellitia* was the only new species, if I except four belated wasps. Certain it is, however, that the "dusk" flights are the strongest. This we were able to confirm at sugar on the 27th. The first round, 5.30 p.m., found several moths on every patch; afterwards, up to 8.30 p.m., not a single new arrival! Only one *Calocampa exoleta* has been taken this autumn, and again no *Agrotis saucia*. On the 27th, male *Hybernia aurantiaria* began to appear; some were found, freshly emerged, on the dead bracken in the wood; later (October 30th, November 3rd and 5th), they could be taken pretty commonly after dark on the twigs of various trees. Several paired examples were captured on November 5th; the males evidently fly just at dusk, and then not again till about 10 p.m.; after November 8th none were seen. About the same dates *Cheimatobia brumata* swarmed on the birches in the swampy parts of the wood. On October 30th the males flew freely at 9.30 p.m. On November 3rd they were flying just as freely at 8.30 p.m.; whilst on November 8th, a crisp, frosty night, with the grass "crunching" under our feet, not a single specimen was observed flying during the time we were there (8–10 p.m.). Every male had forsaken the twigs, and taken up a position on the thicker stems, with wings pressed closely to the back, although on previous nights the wings had invariably been held together above the back. I have but little doubt that the males of our winter moths carry the females to the trees. Many paired examples may be found on the brackens and sticks lying on the ground some distance away from the birches. The capture of two specimens of *Pœcilocampa populi* on a street-lamp on November 13th brought our season virtually to a close, for since that date the weather has been so severely wintry in character as to prohibit collecting in any shape or form. Viewing the year as a whole, we have been favoured with more than an average share of fine collecting days and nights, and I shall look back upon the season 1910 as one full of interest and enjoyment. — Frank Littlewood; 10, Aynam Road, Kendal.

SOCIETIES.

Entomological Society of London.—The Annual Meeting of this Society was held on Wednesday, January 18th, at 11, Chandos Street, Cavendish Square, when the Officers and Council for the forthcoming session, 1911–12, were elected. Owing, however, to the death of Mr. J. W. Tutt, the President-nominate, no successor to the outgoing President, Dr. F. A. Dixey, M.A., M.D., F.R.S., was chosen, and a Special General Meeting will be held later in the year for that purpose. Meanwhile, the following Fellows were elected to act as Officers and Members of the Council:—Treasurer, Mr. A. H. Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and, in place of Mr. Rowland-Brown, M.A., who resigns after eleven years' service, the Rev. G. Wheeler, M.A., F.Z.S.; Librarian, Mr. G. C. Champion, F.Z.S.; other members of the Council, Mr. R. Adkin, Mr. G. T. Bethune-Baker, F.Z.S.; Professor T. Hudson Beare, B.Sc., F.R.S.E.; Mr. M. Burr, D.Sc., F.L.S., F.Z.S.; Dr. F. A. Dixey, M.A., M.D., F.R.S.; Mr. H. St. J. Donisthorpe, F.Z.S.; Mr. J. H. Durrant; Professor Selwyn Image, M.A.; Dr. K. Jordan, Ph.D.; Mr. A. Sich, Mr. J. R. le B. Tomlin, M.A., and Mr. H. J. Turner.—The President, in the course of his Address, after referring to the losses by death sustained during the preceding year, went on to speak of various events of special interest to entomologists, among these being the appointment of Professor Meldola, F.R.S., as Herbert Spencer Lecturer, and Mr. Selwyn Image as Slade Professor of Fine Art at Oxford; the award of the Royal Society's Darwin Medal to Mr. Roland Trimen, F.R.S., and the meeting of the first International Congress of Entomology at Brussels. He then proceeded to deal with certain problems of general biology on which special light had been thrown by entomological study, notably the demonstration that permanent races, differing from the parent stock, could be produced by artificial interference with the germ-plasm. This had been surmised from early experiments of Weismann, followed by Standfuss and Fischer, and had now been placed beyond doubt by the careful work of Tower in America, who had also shown that the new form might stand in Mendelian relation with the stock from which it sprang. Other topics touched upon in the Address were the psychophysical character of the material presented to the operation of natural selection—a point particularly emphasised by Professor Mark Baldwin; and, in connection with this, the special interest attaching to the communities of the social Hymenoptera, where the group rather than the individual appeared as the unit of selection.

Lancashire and Cheshire Entomological Society.—Meeting held *November* 21*st*, 1910, at the Royal Institution, Liverpool. Dr. P. F. Tinne in the chair. — Mr. H. R. Sweeting, M.A., read a paper on "Collecting in the North of Ireland during August, 1910." In this period only eight whole days were free from heavy rain, and in consequence of the unfavourable weather the results were much below what one might reasonably expect under good conditions. The outstanding feature of the holiday was the capture, on a private estate, of a long series of *Hydrœcia crinanensis*; the moth was identified by Mr. F. N. Pierce, who examined all the specimens while the bodies were yet soft enough to permit an inspection of the genitalia. A series of *Cidaria truncata* contained the usual forms, and also a very fine melanic variety of the *centumnotata* form wholly suffused with fuscous, the hind wings being nearly as dark as the primaries; other specimens also had a strong melanic tendency. A series of *Noctua dahlii* contained some almost black examples. The butterflies were noteworthy as showing distinctly brighter colouring than is usually found in England. *Lycæna icarus*, unfortunately, was not met with; the females from this locality, as is well known, have very bright blue coloration. The paper was illustrated by a large scale-map of the district, coloured to indicate the collecting areas, a feature which added greatly to the interest of the descriptions. A discussion ensued, in which several of the members present gave their experiences in the North of Ireland.—Mr. W. B. Crabtree exhibited two aberrations of *Nemeophila plantaginis*, male and female, in which all the black markings were replaced by orange, the ground colour of the fore wings being pale straw-colour, while the hind wings were unicolorous orange; they were taken wild on a mountain near Helvellyn. The same member also showed a variety of *Euchelia jacobææ*, in which the usual red markings were smoky black sparingly intermixed with crimson; this very striking specimen was bred from a larva found at St. Anne's-on-Sea.—Mr. A. W. Boyd showed a large number of Micro-Lepidoptera taken in various parts of Cheshire during 1910.—
—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

OBITUARY.

James William Tutt died at his residence, Rayleigh Villa, Westcombe Hill, where he had lived since 1885, on January 10th, 1911, and was buried in the Cemetery at Lewisham on Saturday the 14th. A large number of colleagues were assembled with the family at the graveside, and wreaths were sent by the Entomological Society of London, the South London Natural History Society, the South Eastern Union of Scientific Societies, and a host of private friends and admirers; while special delegates were present as representatives of the several Societies with which he had been so closely associated.

Mr. Tutt was only in his fifty-third year, having been born on April 26th, 1858, at Strood, in Kent, where he was educated at the St. Nicholas Schools from 1865 to 1875, after which time, having determined on the scholastic profession, he proceeded to St. Mark's Training College, Chelsea (1876–77), where he passed Double-First in certificate examinations; obtained from the Board of Education a profusion of certificates; and matriculated in the First Class in the University of London, but did not follow it up to a degree.

He early became Headmaster of Snowfields Board School, and successively of Webb Street School and of the Higher Grade School at Portman Place, and but a few months since was appointed to the new Morpeth Street Central School, the first of a departure in higher grade schools. In all these positions his energy and organizing power were conspicuous, as well as his ability to make the most of the boys under him, though he felt that he was often thwarted by various items that may be summed up as "red tape"!

In an address published in the 'Entomologists' Record,' vol. vi. p. 59, we find a few autobiographical items. He tells us that he was first attracted to entomology at the age of thirteen, and, having followed it up in a boyish way, but, no doubt, with his characteristic energy and acumen, was at fifteen a confirmed entomologist, and though his library was defective, he had, what was decidedly more educative and useful, in the immediate vicinity some of the finest collecting-ground in England—a matter of first importance at that stage of his evolution.

In 1881 he met Mr. Coverdale, a name little known to entomologists, but clearly as enthusiastic, as active, and as fully imbued with the scientific spirit as Tutt himself, some of the Coverdale specimens and preparations in Mr. Tutt's possession remaining to testify to this; while there can be no question but that this association was an important factor in guiding the younger man into the line of entomological work in which he became distinguished. Unfortunately, shortly afterwards Coverdale went abroad, and appears to have fallen a victim to some tropical malady. But Mr. Tutt used often to refer to this "guide, philosopher, and friend" with veneration, and Coverdale's communications to the 'Entomologist' in 1885 and the few preceding years show him to have been a man of unusual ability.

It was at this period that Tutt began to send notes to the 'Entomologist,' the earliest being apparently one in 1884 on prolonged pupal duration in *Eriogaster lanestris*. And very soon after he became the most frequent and voluminous contributor, so that it was not long before this outlet for the record of his observations became inadequate, and in 1890 the 'Entomologists' Record and Journal of Variation' was founded under his editorship.

During this period also he was very active as a member both of the City of London and South London Societies, and he joined the Entomological Society of London in 1885. He presided over the City of London Society from 1896 to 1899, and over the South London in 1899. He first joined the Council of the Entomological Society in 1897, and, after three further years on the Council, 1908–10, was President-nominate at the time of his death, and would have succeeded to the Presidency had he lived but a few days longer. Meanwhile his work in helping to place its publishing activities on a more business-like basis was of the highest value to the Society, the experience gained by him in the publication of his own numerous works having equipped him with the necessary grasp of a highly technical subject. He was also very active in the South Eastern Union of Scientific Societies, and edited their 'Transactions,' besides enjoying the privileges as Honorary Member of several Foreign Societies.

His entomological work was extensive and incessant; besides many lectures and addresses to Societies, he edited the 'Entomologists' Record' for twenty-two years, and hardly a number appeared without something from his pen; the papers extended and republished from these, and from contributions to the 'Entomologist,' forming a considerable series, such as the important review of the British Noctuæ in four volumes, the papers on Melanism, on the British Pterophorina, on Migration, &c. His 'Practical Hints,' in three volumes, is to a great extent separate from these. It illustrates something of his method of working, and the unstinted labour he must have bestowed in collecting his material. He seems to have explored with meticulous care the magazines, the various systematic works on Lepidoptera, and, in fact, all accessible published matter, and arranged extracts or made indices, so that he had collected a mass of information available in almost every direction. It was in this way that he successfully brought together the many scattered observations which enrich his *magnum opus*, the 'British Lepidoptera.'

Mr. Tutt also wrote more popular volumes—on 'British Butterflies' (Gill), and 'British Moths' (Routledge). His three volumes, 'Rambles in Alpine Valleys,' 'Woodside, Burnside, Hillside, and Marsh,' and 'Random Recollections' reveal him not only as a close observer revelling in all scenes of wild Nature, but also as possessing no small poetic inspiration.

But the 'British Lepidoptera' was no doubt the work in which he considered his labours were to culminate, and to which he devoted himself with but too much ardour. Of this, five volumes on Moths have appeared, and the fourth on the Butterflies was nearing completion, and they are noteworthy not only for their encyclopædic character in relation to each species handled, but for the critical discussions on many points of classification and nomenclature. This, however, is not the place for further review, beyond noting the evidence afforded of Tutt's amazing industry, and the width and vigour of his mental grasp.

A detailed list of his works will probably be compiled in due time. Reference has been made to the most prominent of them.

But although every moment of his leisure was occupied with his literary labours, he yet found time to promote the welfare of the Entomological Societies with which he was connected by securing for them many new members. And making all allowance for the spirit and progress of the age, and for no man being indispensable, we certainly owe it to him more than to anyone else that British entomologists are more numerous and take a more scientific view of their studies than was the case twenty years ago.

I first made Mr. Tutt's acquaintance in connection with his papers in the 'Entomologist' on British Noctuæ, and recognized in him the realization of a keen and scientific intelligence, very rare amongst the entomologists I knew. It was later that I discovered he possessed in an extreme degree that fundamental quality of genius, the capacity for taking pains. It was simply impossible for him to be idle; he must work away at full steam all the time. He was a born schoolmaster; he must be learning himself or teaching others. He could expound *extempore* any subject he was studying, and seemed absolutely fond of writing. One wondered, as he taught so much, how he had time to learn anything, till one realized how rapidly he could understand and assimilate new material, how instantly he assigned it its proper value and position amongst the rich stores of his memory, and how rarely he was wrong, though for the majority only the most superficial judgment of the matter would have been possible in the time. On the rare occasions when he did fall into error, he was willing to correct his position without the slightest reluctance. But he had very little patience for opinions which he saw to be erroneous, no matter in what way; and in his earlier days his contemptuous onslaughts at times gave offence to persons who thought he was attacking not their errors but themselves. In spite of this characteristic, perhaps truly associated with it, was his remarkable power of enlisting the efforts of all and sundry, both in the service of entomology simply or in assisting himself in whatever subject he was occupied with. Whilst thus claiming and securing the co-operation of others, he was always ready to help them as far as he could, and when he failed to do so it was rarely from other cause than absolute want of time, and for his friends or anyone who asked his assistance he strenuously exerted himself, not seldom at considerable self-sacrifice.

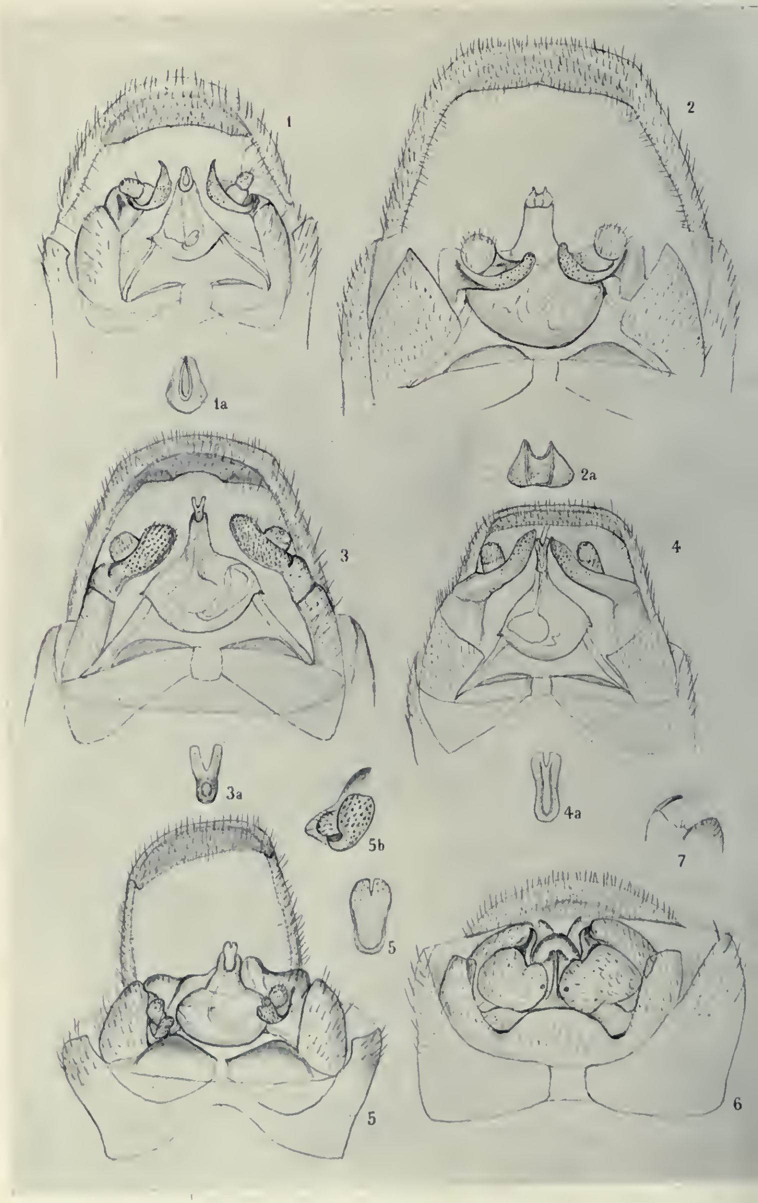
I had the pleasure of accompanying Tutt on his first visit to Scotland and his first tour in the Alps, and his keen appreciation of and unbounded pleasure in the new experience were most exhilarating. His interest in European insects had already been awakened, but henceforth the study of the palæarctic rather than the mere British fauna seemed to occupy him. His extensive collections, occupying some dozen cabinets, are less remarkable for the rarities they contain than for presenting many long series, and for being very largely of his own collecting. It is stated that they are to be disposed of during the next two years.

Mr. Tutt began life with a serious cardiac disorder, which he was not expected to get over; complete accommodation, however, took place, and for most of his life it could hardly be said to handicap him in any way. Nevertheless, it is probable that of late years over-work—and I have already said that it was impossible for him to be other than hard at work—and an East End atmosphere were answerable, owing to the heart weakness, for the various illnesses which culminated in the fatal attack.

His death is a great loss to entomology: besides the loss of his own work, a source of energy animating others and collating their work disappears. His death is impressively disastrous in so far that it occurred when he was at the height of his powers, and with apparently many years of productive activity before him, and the irony of fate culminates in his having been about to assume the Presidency of the Entomological Society of London.

Mr. Tutt married Frances Marsh Collins, of Rochester, and leaves two sons and three daughters, of whom several have already left the parental home, two being married.

T. A. C.



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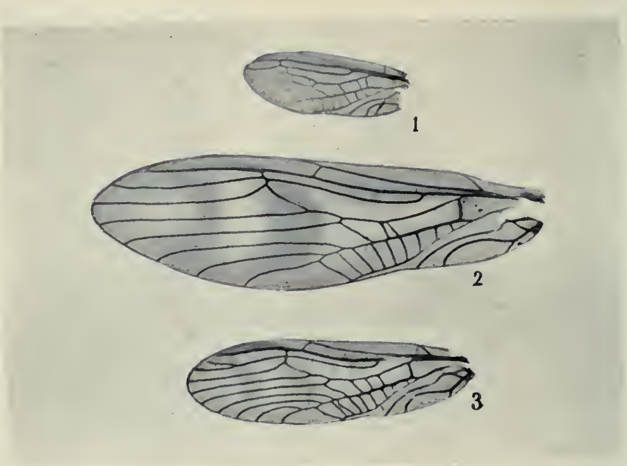
THE GENUS TÆNIOPTERYX.



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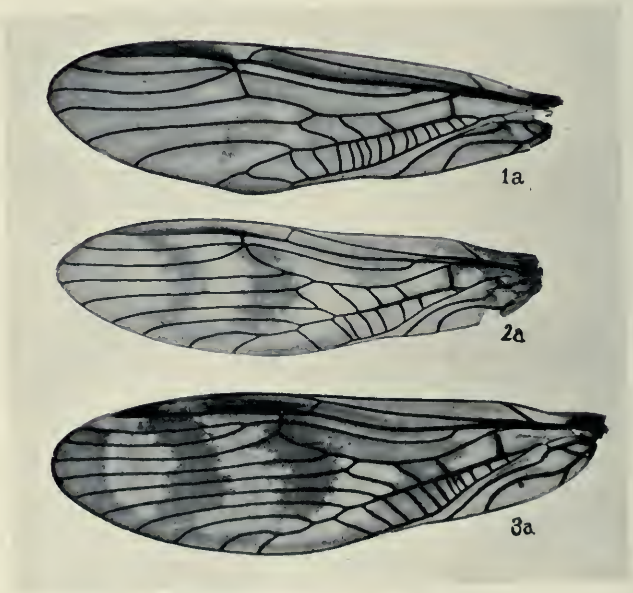

FEMALES.

Dr. Fr. Ris photo. West, Newman proc.

FORE WINGS OF TÆNIOPTERYX.

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ON *TÆNIOPTERYX PUTATA*, NEWMAN (PLECOPTERA), WITH NOTES ON OTHER SPECIES OF THE GENUS.

By KENNETH J. MORTON, F.E.S.

(PLATES II. & III.)

IN the Trans. Ent. Soc. Lond. 1896, p. 58, when describing *Tæniopteryx risi*, I made some remarks on *T. trifasciata*, Pict., partly based on material from Scotland in my own collection, and partly on Continental specimens received for examination from Mr. McLachlan. The species of the genus were, however, at that time very imperfectly understood, and in the light of what is now known it is almost certain that what I had then before me as *T. trifasciata* did not all belong to the same species. The material is not now available for re-examination. Quite a number of species belonging to the genus have since been satisfactorily separated. At the same time, I am not sure that unanimity of opinion yet prevails as to what constitutes the true *T. trifasciata* of Pictet.

In the paper above-mentioned, the insects from Scotland were certainly what I then regarded as typical *T. trifasciata*. This determination was, I admit, to a great extent due to the fact that both McLachlan ('Catalogue of British Neuroptera,' 1870) and Albarda ('Catalogue des Nevroptères observées dans les Pays Bas,' &c., 1889) had referred Newman's *Nemoura putata* (the type of which was from Scotland) to *T. trifasciata*, Pict. Klapálek, on the other hand, has since put forward the view that the true *T. trifasciata* is to be found in an insect which he took at Vienna, in which the wings of the male are very much more reduced. I have not seen the female of this Vienna insect, but the male is a very different thing from the Scottish representative of the *trifasciata* group. Certainly, on the whole, Klapálek's insect comes nearer to Pictet's figure than does the Scottish insect, to which, as far as I am able to judge at present, the name of *putata*, Newman, must be applied, if Klapálek's view proves to be right. The final solution of the question will probably rest with the Swiss entomologists, when materials have been obtained from Geneva.

Newman's description of his "*Nemoura putata*" appeared in the 'Entomological Magazine,' vol. v. p. 401 (1838), and his diagnosis (for a copy of which I am indebted to Mr. Herbert Campion) is as follows:—

"Nemo. putata.—*Fusca, nitida ; antennæ moniliformes, alis fere longiores, et cum pedibus, concolores : alæ fusco-tinctæ, brevissimæ, metatibias sedentis haud dimidio exporrigentes.* (Corp. long. ·3 unc. ; alar. dilat. ·55 unc.)

. . . . . .

"Inhabits Scotland. Taken by Mr. Walker at New Lanark : will form a genus of future authors."

This diagnosis, without material change, is repeated in the 'British Museum Catalogue of Neuropterous Insects,' Part I, 1852, p. 190, but there is nothing there to indicate that the Museum possessed an example. Nevertheless, the presumption is strong that Newman's type went to the British Museum. Professor Lowne, the Curator of the Entomological Club's Cabinets, informs me that he never had either Newman's British or foreign Perlidæ, although he remembers seeing them at Newman's, and he suggests that they went to the British Museum. The late Mr. McLachlan long ago told me that Newman's foreign Perlidæ were in the British Museum, but he was never quite satisfied that the British examples were there, and I suppose the official records throw no light on the point.

Mr. Herbert Campion very kindly made a search in the Museum Collection for this type, but without conclusive results. I suppose it is a well-known fact that Stephens's collection of Neuroptera was at one time arranged by someone who was not quite an expert in the order, and who seems to have been the cause of seriously impairing the value of the collection to future workers. Mr. Campion reports that there are three insects in the British cabinet over a printed label reading: "21 putata Newm." Two of the insects, he says, have clearly nothing to do with the present question, but the third is of importance, and Stephens's own MS. label pinned beside it seems to relate to that specimen alone. Mr. Campion is satisfied, after comparing it with one of my males from Clydesdale, that the two belong to the same species. I am much inclined to think that this specimen is either the actual type, or at least that it may have been received from the same source—that is, from Henry Walker, of New Lanark.

While unfortunately it is not possible to get that absolute proof which a comparison with the known type would have afforded, yet Newman's description can hardly refer to anything else than to my earlier *T. trifasciata*. The locality, New Lanark, refers no doubt to the River Clyde, near that place. The banks of this river, which were my favourite hunting-grounds for many years, produces in early spring two species of *Tæniopteryx*, both of which have short-winged males, but the reference to the moniliform antennæ can apply to my *trifasciata* alone.

The British species of *Tæniopteryx* are three in number, viz. *putata*, Newman, *risi*, Morton, and *nebulosa*, Linné.

Little needs to be said about the last-named, which is separable from the others at a glance. Klapálek has placed it in a separate genus, *Nephelopteryx*. If the two genera are adopted, they may be distinguished thus:—

Cubitus of the fore wings emitting two to four branches outwards to the hind margin. Ventral plate (*lamina subgenitalis*) of the male long . . . *Tæniopteryx*, Pict.

Cubitus of the fore wings emitting but one branch outwards to the hind margin. Ventral plate of the male short . . . . *Nephelopteryx*, Klap.

In British examples of *nebulosa* the male, as has been indicated, has frequently very much abbreviated wings, but not always so; specimens occasionally appear almost as full-winged as Continental examples. Mr. Martin E. Mosely recently sent me one from Dovedale in full-winged condition. It may be that micropterism is more dominant in the North, but it is probably not confined to that quarter. When the wings are full in the male, it of course approaches in appearance to the female. The shortest-winged males are very remarkable, sprawling creatures, the legs appearing to be out of all proportion to the size of the insect. The short-winged forms seem to have the apical process of the *valvula subanalis* shorter than is usual in the long-winged condition (see fig. 7), but there is no very striking difference, and there may be a certain amount of individual variation. The short-winged male of *nebulosa* may also be separated from the male of *putata* by the moniliform antennæ of the latter. The wing-markings in *nebulosa* are usually very vague, and I cannot say that I have ever seen a female example with such distinct fasciate markings in the wings as are shown in Albarda's figure ('Annales de la Soc. Ent. Belg.' xxxiii. pl. i.). *T. nebulosa* appears very early, from February to April, according to locality and season, and it seems to last but a short time.

The two other species, *T. risi* and *T. putata*, present no difficulty in determination. The latter, as a rule, occurs earlier than *risi*, but *risi* may be found as early as April along with the others, while it continues to appear in higher districts even to July.

The differences between the two species may be tabulated thus:—

MALES.

a. Short winged; in fore wing three sectors, as a rule, going from cubitus to hind margin; neuration rather close, and markings in British examples, at least, usually small and faint. Antennæ rather thick, joints moniliform. Ventral plate not produced at the apex, the margin of which is excised . . . *putata*, Newman.

aa. Full winged; in fore wing two sectors, as a rule, going from cubitus to hind margin; neuration wider; fasciate markings usually distinct. Antennæ slender, joints not moniliform. Ventral plate produced, upturned, margins entire . . . . *risi*, Morton.

(For side view of ventral plates, see figs., Trans. Ent. Soc. Lond. 1896, pl. ii.)

FEMALES.

a. Wings with three more or less distinct fasciæ, and in addition the apex of the wing is occupied by a well-defined marking which may be connected posteriorly with the immediately preceding fascia, but which is frequently separated therefrom anteriorly by the space between the radial sector and the radius; three or four sectors going from cubitus to hind margin *putata*, Newman.

aa. Wings with three more or less distinct fasciæ, but the apex of the wing without any well-defined marking, although the whole apex beyond the outmost fascia may become somewhat darkened in very mature examples. Neuration less close; two or three sectors going from cubitus to hind margin . . . *risi*, Morton.

In the meantime, I cannot attempt to give anything like an outline of the geographical distribution of these insects. Practically the whole material dealt with has been drawn from Scotland, chiefly from Rannoch and Clydesdale. All three abound in Perthshire at the proper time, and I took all of them in Lanarkshire on April 9th and 10th, 1910. I have little hesitation in saying that they occur pretty generally throughout Scotland. No doubt they occur in many English localities.

For *T. risi*, Mr. Porritt gives the following localities: Harden Clough, near Huddersfield, and Dunford Bridge, both in South-western Yorkshire (Porritt); and Buckden in Wharfedale, North-western Yorkshire (Carter). Other localities are Haslemere, Surrey (July), River Yealm, at Cornwood (May 16th), both in McLachlan's collection; and Mr. Briggs records it as rare at Exeter, Bickleigh Vale (Bignell), and not uncommon on East Lyn River (April, Briggs).

T. nebulosa, according to Briggs, has been taken near Exeter (Parfitt), and at Exminster (March, Bignell); and Porritt has it from Pickering, East Yorkshire (February 1st).

The only species known from Ireland with certainty is *T. risi*, which is common about rapid streams in Co. Wicklow in April (Halbert).

It may be useful to consider shortly some of the allied Continental forms. With this end in view I have made *camera lucida* sketches of the apex of the abdomen from above of several species. These figures are more or less diagrammatic. The figures of the ventral plate serve only to show its outline; no attempt has been made to represent fully the structures lying within the hollow of this plate. The form of the cerci is important and useful, but it appears that allowances must be made occasionally in respect of the position they happen to occupy in each preparation. The remarkable, strongly chitinized vesicle, called by Klapálek the supra-anal lobus (or *valvula supra-analis*), is a very striking feature, and the point of the dorsal appendage of this organ affords good specific characters [*cf.* Klapálek, " Geschlechtstheile der Plecopteren ": 'Sitzungsber. der kais. akad. d. Wiss. in Wien, Mathem.-naturw. Classe,' Bd. cv. Abth. i. 1896, pp. 35–41, Taf. v. (named *T. trifasciata*, but refers to *braueri*)].

Comparing Klapálek's figures of the apex of the appendage of the supra-anal lobus of various species of *Tæniopteryx* ("Ueber neue und wenig bekannte Arten der Paläarctischen Neuropteroiden," p. 11: 'Bulletin internatl. de l'Academie des Sciences de Bohême,' 1901), *T. putata* is a little suggestive of *tristis*, Klap., but this species is evidently different, having only two sectors going from the cubitus to the hind margin. It is very unlikely that *putata* will prove to be restricted to Great Britain. Yet, with one exception, I have never seen anything like it from the Continent. The exception is represented by a pair of *Tæniopteryx* from Czarnohora, in the Eastern Carpathians, received from Mr. Josef Dziedzielewicz: ♂, March 5, ♀, March 15, 1909. These were sent under the name of *T. braueri*, but they do not belong to that species. The male has full wings, but in its structure it comes near *putata*. The female is in a rather curious condition, the apical marking of the fore wings being small, and the subapical crescent hardly indicated at all. It would be interesting to know whether this is an individual variation or normal for the locality. The small apical marking recalls *braueri*, but the facies of the insect is rather different. If I am right in supposing this insect to be *putata*, then the wing-markings are subject to wide fluctuation, and the characters drawn from Scottish specimens will not be universally applicable.*

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* I have since received a second pair from the same source. In the female the markings are more normal; the free sectors of the cubitus in the fore wings are respectively two and three. In the male the sectors are two in both fore wings. This form is certainly close to *putata*. In the latter

The other European species of the restricted genus *Tæniopteryx* known to me are as follow:—

T. braueri, Klap.—This species, like *putata*, has the antennæ distinctly moniliform. The male is, however, full winged. The female is very similar to *putata* female, but the apical marking of the fore wings in *braueri* is apparently always quite isolated. Klapálek states that *monilicornis*, Pict., is a condition of this species, in which the antennæ are strongly moniliform and the wings without any transverse markings. Probably *braueri* will prove to be a widely distributed species. I have seen it from Bohemia (March, Klapálek) and Spain (♂, Jan. 23, ♀, Feb. 11, Navás). Petersen records it from Denmark.

T. trifasciata, Pict. (Klapálek).—The male has distinctly moniliform antennæ; female, antennæ with cylindrical joints. The wings of the male are in a peculiar condition, the fore wing being only about half as long as the hind wing (*cf.* 'Die Süsswasserfauna Deutschlands (1909), Plecoptera,' by Klapálek, pp. 57–8, fig. 88). The male is known to me from a series from Vienna (March 31, 1899, Klapálek). The female I have not seen; Klapálek describes the wings as "mattgrau, die Spitze und 3 fast gerade Querstreifen dunkler."

T. kempnyi, Klap.—Antennæ setiform, with short joints (somewhat moniliform in the male) in the proximal fifth. Full winged in both sexes. In the female especially the bands are fairly well marked, but perhaps as a rule less conspicuous than in *putata* and *braueri*. Apical spot quite small and isolated. Known to me from Switzerland (Dietikon, March 16, Ris), and Lower Austria (Gutenstein, March and April, Kempny).

T. seticornis, Klap.—Antennæ as in *risi*, slender, with cylindrical joints longer than broad. Full winged in both sexes, the membrane being less grey-looking than in the other species; neuration dark and distinct. Transverse markings small but very distinct; apical marking absent or just indicated by a darkening of the tip. The anal veins in the hind wing sometimes margined with grey, giving these wings a pretty radiate appearance. It is recorded by Klapálek from the Böhmerwald, Riesengebirge, Erzgebirge, and Harz (June and July), and I have received a male from the Eastern Pyrenees (Vernet-les-Bains, April 24–May 9, 1909, Dr. Chapman).

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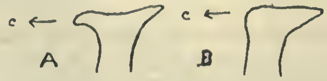
the apex of the dorsal appendage of the supra-anal lobus, seen from side, projects strongly cephalad; this projection is hardly indicated in the Carpathian male (fig. A, *putata*; B, male from Carpathians; c indicates the direction of the head).



It should be added that *T. nebulosa* and *T. risi* appear to be widely distributed in Continental Europe.

In connection with this paper I have to express my thanks to my ever-obliging friend, Dr. Fr. Ris, of Rheinau, who in the midst of much more important work kindly took the trouble to make preparations of a series of wings, and to photograph them. To British entomologists wishing to identify any specimens of *Tæniopteryx* they may meet with, these wing-photographs cannot fail to prove most useful aids.

EXPLANATION OF PLATES.

Plate II.

Fig. 1.—*Tæniopteryx trifasciata.* Pict. (Klap.), from Vienna.
,, 2.—*T. braueri*, Klap., from Karlin, Prague, Bohemia.
,, 3.—*T. putata*, Newman, from Scotland.
,, 4.—*T. kempnyi*, Klap., from Dietikon, Switzerland.
,, 5.—*T. risi*, Morton, from Scotland.
In each case, apex of abdomen of ♂ from above.
**a*. Apex of dorsal appendage of supra-anal lobus, from above, more enlarged. 5 *b*. One of the cerci of *T. risi*, from above (more enlarged), from another specimen.
,, 6.—*T. nebulosa*, Linn., from Scotland; apex of abdomen of male from above.
,, 7.—*T. nebulosa*, from Lower Austria; apical process of valvula sub-analis (?).

Plate III.

Fore wings of Male.—Fig. 1. *T. nebulosa* (micropterous form) (nat. length, 4·8 mm.). 2. *T. risi* (nat. length, 10·7 mm.). 3. *T. putata* (nat. length, 6·7 mm.).

Fore wings of Female.—Fig. 1. *T. nebulosa* (nat. length, 12·1 mm.). 2. *T. risi* (nat. length, 11·4 mm.). 3. *T. putata* (nat. length, 13·1 mm.).

* "*a*" accidentally dropped from smaller fig. 5.

ON THE ECONOMY OF THE ICHNEUMONID *MONOBLASTUS PALUSTRIS*, Illgr.

By Rupert Stenton, F.E.S.

On June 10th of last year a female was brought to me of the above Tryphonid, which had been observed by its captor to oviposit in a larva of *Emphytus cinctus*, L. On a supply of these sawfly larvæ being obtained—an easy matter, as they are a serious pest in this Herne Hill district to those possessing valued varieties of roses—and one of them being introduced to the ichneumon, parasitization almost instantly followed. This was effected close behind the head, the operation occupying a few seconds, the larva not making the slightest outward show of objection, though this was certainly exceptional I afterwards found, because a considerable number of larvæ were parasitized by this and another female of the same species during the next ten days, and they did make what resistance they were capable of, by throwing themselves violently to and fro from side to side during the process of investigation by the ichneumons' antennæ and subsequent parasitization, and would often fall to the ground with the parasite attached, but it was all wholly ineffectual.

On an average about four larvæ were parasitized a day, but very likely more would have been had they been supplied, and no doubt it falls short of the number had the insects been at large.

From one cause or another I lost all my *Emphytus* larvæ in which ova had been deposited except one, parasitized on the day of the first ichneumon's capture. For some time prior to July 27th this larva had been lying quiescent as though dead, which no doubt it was, as on that day the parasitic larva emerged from it, leaving only the shrivelled skin, showing that it had occupied the whole of it. Ordinarily, no doubt, the sawfly larva would have entered a stem of some sort, containing pith, as is their habit, with the intention of pupating, but nothing of this nature was provided.

The *M. palustris* larva was cylindrical, the head and first segment and the two apical segments quite white, the intervening space being green from the interior parts of the creature showing through the skin. There was a very dark green line, bordered by white granules along the dorsal area, throughout the length of the green part, the lateral lines, ventro-lateral lines showing only in the segmental divisions, and a dark ventral line. I counted fourteen segments, including the cephalic one. There was a very slightly discreted border, not very evident. The mouth parts were discreted with fuscous and the antennal tubercles, large, concolorous, and not protruding beyond the level of the head.

The animal had begun to spin some strands of silk, evidently the commencement of its cocoon, presuming this to be a cocoon-spinning species, which it had every indication of being. But I removed it to figure the facial characters, and have found that to do this with larvæ of other species disorganizes them to the extent of incapacity to ever finish the cocoon, as was the case with this one, but it did not result in its ultimate demise as I expected.

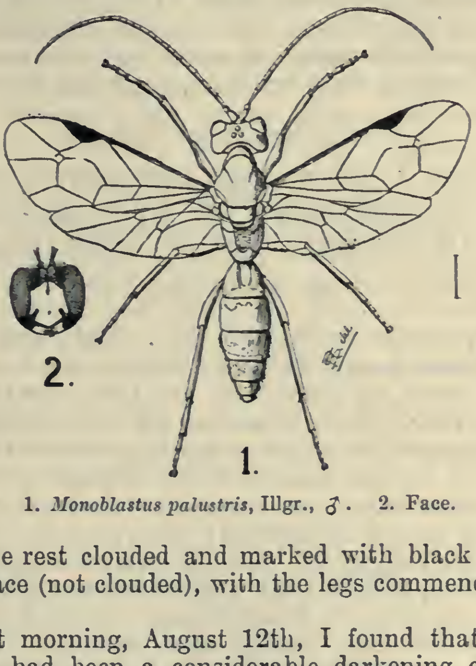
It was now placed in a glass tube, where it spun some silk at each end.

On August 1st signs of pupation began to show, a red spot appearing on each side under the skin of the second body-segment, the eyes of the imago forming, the next three segments showing the contraction for the thorax, now turned to yellowish, the rest white and taking on more of the future imaginal abdominal outline, the extreme apex being buried in a thick black fluid, the larval excreta.

By the morning of the next day there was some more development in outline towards pupation, which then took place. In the evening it had got clear of the black fluid.

Beyond a darkening of the eyes and ocelli there was no visible change until August 10th, when there was a slight clouding of the cheeks and whole thorax, of which the mesothorax and mesosternum were nearly black, as were two marks down the metanotum, and the mandibles red at the tips.

On the evening of August 11th the head, thorax, and coxæ were quite black, a black patch on the dorsal area of the two first abdominal segments, next two clear except two dots on each ventrally, the rest clouded and marked with black only on the ventral surface (not clouded), with the legs commencing to show colour.



1. *Monoblastus palustris*, Illgr., ♂. 2. Face.

The next morning, August 12th, I found that during the night there had been a considerable darkening of colour all round, the dorsal surface of the third and fourth abdominal segments now being orange, legs more red, antennæ clouding, and mandibles darker.

The following evening, August 13th, there was an exudation of moisture and the pupal skin cast, except from the extreme anal end. By the evening of August 14th this was discarded altogether, and some whitish pellets of exuviæ exserted, and in the morning, August 15th, the imago, a male, was running round the tube ready to emerge.

Though the economy of this species, as far as investigated, does not present any phenomena of more than usual interest, it is rarely that any glimpse of what takes place during the early stages of an internal, presumably, cocoon-spinning parasite is afforded, and Mr. Claude Morley, who kindly determined my insects, has pointed out that as a British species *M. palustris* has up to now only been represented by a single known female in the British Museum, captured by the late Rev. T. A. Marshall at Bugbrooke, Northants.

It would probably be found not uncommonly in the gardens of Herne Hill and district, about the rose trees infested with the host, as five females were taken in addition to the male that was bred, and one female in August, 1909.

I might mention that on July 28th imagines of *Emphytus cinctus* of the second brood began to fly, so that by the time the parasites of the other sex—which would most probably appear in the open about the same time as the bred male emerged—were ready for oviposition there would be, no doubt, a stock of larvæ in readiness.

A SYNONYMIC LIST OF THE PANORPIDÆ OF JAPAN, WITH CORRECTIONS TO MY FORMER PAPER,* AND DESCRIPTION OF A NEW SPECIES.

By T. Miyake.

Japan is very rich in scorpion flies. Until now, more than forty species have been described. Navas' papers and mine are perhaps the latest on the subject, and they were issued almost at the same time. Each of us has published twice, and each time mine appeared two or three months later than his. I have no intention of protesting against law of priority as applied to zoological nomenclature, and there is not the least question that Navas' names should be adopted; but I must say that both of my papers were respectively ready for print over one year before they were issued, though their publication was delayed by circumstances which it is not necessary to detail here. This explains why the same species were described by me under names which are now to be relegated to the list of synonyms. The *brachypennis* of my first paper is a synonym of his *nipponensis*, as I mentioned in my second paper, and Mr. Navas in his. Again, in the last paper of Mr. Navas, some species are described which appear to stand very close to some of the species of my second paper, as, e. g., *Panorpa nævia*, Navas, to *Panorpodes apicalis*, Miyake, and *Panorpa limbata*, Navas, to *Panorpodes singularis*, Miyake. Of these, the last-mentioned species, though very closely allied, still appear to me distinct, unless further facts be brought to light, as there are a number of species of our Panorpidæ which are recognized as distinct just by such degrees of difference as are found in the above two species. *Nævia*, N., and *apicalis*, M., appear to me to be identical, and *apicalis* must be looked upon as a synonym of *nævia*. If this be the case, then it is very strange that the two species of Navas were put in the genus *Panorpa*. They belong undoubtedly to the genus *Panorpodes*, as may easily be seen from such characters as *short rostrum, simple claws*, and many others, and it is still more strange to me that Mr. Navas describes a new species of *Panorpodes* in the same paper.

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* "A Further Contribution towards the Knowledge of the Panorpidæ of Japan," 'Journ. Coll. Agr. Imp. Univ. Tokyo,' vol. ii. No. 3 (1910).

I must here correct some errors in my last paper. My identifications of *Panorpa lewisi*, M'Lach., and *P. bicornuata*, M'Lach., were erroneous, and I now consider my *chuzenjiensis* as identical with the former, and *magnicauda* with the latter, so that these names should respectively be relegated to the list of synonyms. Again, in the key to the species, *cornigera* was placed by mistake in the *Aulops* group of Enderlein, and of course should have been placed in the *Panorpa* group of the same author.

Navas has made some remarks on *Bittacus sinense* of Matsumura and mine, and says, "Il y a lieu à douter si on a pris plusieurs espèces pour une seule." It may be so or may not be so, but at any rate I am making some investigations which I hope will settle the question. In the meanwhile, Navas' opinion is followed in this list. Anyhow, the species of our Panorpidæ already known need further examination as to their specific names.

The following list has been drawn up for preliminary purposes, and will probably need further correction. In the meantime, my own study is being continued :—

PANORPA, Linn.

1. *Panorpa cornigera*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 404.
2. *P. communis*, L., Matsumura, 'Senchuzukai' ('Thousand Insects of Japan'), vol. i., p. 164, pl. xi., fig. 6 (1904).
3. *P. gokæensis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 193, pl. xi., fig. 3 (1910).
4. *P. galloisi*, n. spec. (described p. 93).

AULOPS, Enderl.

5. *Aulops japonica*, Thunb., Nov. Ins. Sp. Dissert., iii., p. 67, fig. 9 (1784); Westwood, Trans. Ent. Soc. Lond., vol. iv., p. 188 (1845); M'Lach., *op. cit.*, 1878, p. 183.
6. *A. leucoptera*, Uhl., Proc. Ac. Nat. Sci. Philad., 1858, p. 31; Trans. Ent. Soc. Lond., 1878, p. 186.
7. *A.* ? sp., Hagen, Stett. ent. Zeit., 1867, p. 90; *Panorpa hageni*, Navas, Rev. Russ. Ent., 1909, p. 4.
8. *A. macrogaster*, M'Lach., Trans. Ent. Soc. Lond., 1878, p. 184.
9. *A. klugi*, M'Lach., *l. c.*, p. 185.
10. *A. pryeri*, M'Lach., *l. c.*, p. 186; *Panorpa bouvieri*, Navas, Mem. R. Acad. Ci. Bar., vol. vi., No. 25, p. 20 (1908).

11. *A. wormaldi*, M'Lach., *l. c.*, p. 186; Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 202 (1910).
12. *A. lewisi*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 402; *Panorpa chuzenjiensis*, Miyake, Journ. Coll. Agr. Imp. Tokyo, vol. ii., No. 3, p. 201 (1910).
13. *A. bicornuata*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 403; *Panorpa magnicauda*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 192, pl. xi., fig. 6 (1910).
14. *A. nipponensis*, Navas, Mem. R. Acad. Ci. Bar. vol. vi., No. 25, p. 20 (1908); *Panorpa brachypennis*, Miyake, Bull. Coll. Agr. Imp. Univ. Tokyo, p. 9, pl. i., fig. 6 (1908).
15. *A. drouarti*, Navas, Mem. R. Acad. Ci. Bar., vol. vi., No. 25, p. 21 (1908).
16. *A. dyscola*, Navas, *l. c.*, p. 22.
17. *A. ochracea*, Miyake, Bull. Coll. Agr. Imp. Univ. Tokyo, p. 3, pl. i. fig. 9 (1908).
18. *A. sinanœnsis*, Miyake, *l. c.*, p. 4, fig. 7.
19. *A. rectifasciata*, Miyake, *l. c.*, p. 5, fig. 10.
20. *A. striata*, Miyake, *l. c.*, p. 6, fig. 1.
21. *A. niphonensis*, Miyake, *l. c.*, p. 7, fig. 3.
22. *A. pulchra*, Miyake, *l. c.*, p. 8, fig. 4.
23. *A. trizonata*, Miyake, *l. c.*, p. 9, fig. 11.
24. *A. takenouchii*, Miyake, *l. c.*, p. 10, fig. 5.
25. *A. nikkœnsis*, Miyake, *l. c.*, p. 11, fig. 2.
26. *A. ochraceopennis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 190, pl. xi., fig. 1 (1910).
27. *A. obscura*, Miyake, *l. c.*, p. 195, fig. 2.
28. *A. multifasciaria*, Miyake, *l. c.*, p. 196, fig. 5.
29. *A. irregularis*, Miyake, *l. c.*, p. 198, fig. 7.

LEPTOPANORPA, M'Lach.

30. *Leptopanorpa ritsemæ*, M'Lach., Trans. Ent. Soc. Lond., 1875, p. 187.
31. *L. sieboldi*, M'Lach., *l. c.*, p. 188.

PANORPODES, M'Lach.

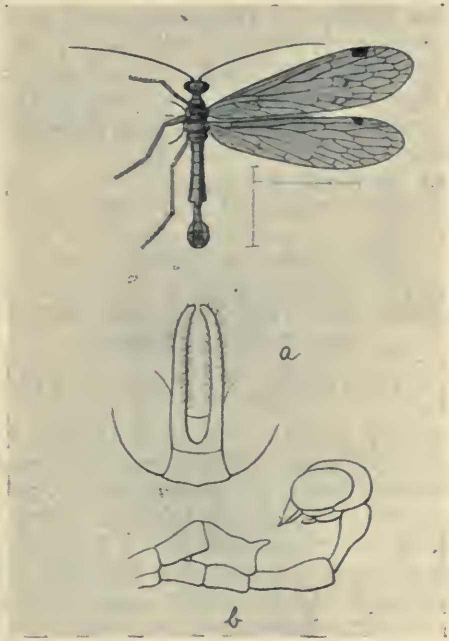
32. *Panorpodes paradoxa*, M'Lach., *l. c.*, p. 189.
33. *P. decorata*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 405.
34. *P. nævia*, Navas, Rev. Russ. Ent., 1909, p. 1; *Panorpodes apicalis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 203, pl. xi., fig. 4 (1910).
35. *P. limbata*, Navas, Rev. Russ. Ent., No. 3, p. 2 (1909).
36. *P. notata*, Navas, *l. c.*
37. *P. singularis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 204, pl. xi., fig. 7 (1910).

BITTACUS, Latr.

38. *Bittacus sinense*, Walk., List Neur. Ins. Lond., 1853, p. 469; M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 406; Matsumura, 'Senchuzukai,' vol. i., p. 165, pl. xi., fig. 5 (1904).
39. *B. nipponicus*, Navas, Rev. Russ. Ent., No. 3, p. 3 (1909).
40. *B. lævipes*, Navas, *l. c.*, p. 4 (1909).

Panorpa galloisi, n. sp. (*Futaten-shiriagemushi.*)

Subcosta of the fore wing extended to the pterostigma, as in *P. communis* and *P. cornigera*. Body blackish piceous; rostrum blackish piceous (slightly shorter than that of our other Panorpids), with the palpi piceous; legs testaceous. Wings rather broad (broadest at the pterostigmatal region), whitish with the fuscous veins, with the apex acutely elliptical; the only conspicuous markings (fuscous in colour) are of somewhat quadrate form in the fore wing and of a triangular shape in the hind wing and are situated at the pterostigma, which is somewhat opaque, occupying its middle one-third; three very insignificant spots found in the fore wing placed obliquely from the pterostigma to the hind margin, the first situated at the middle of the wing and the last at the hind margin.



***Aulops galloisi*, n. sp., male.—*a*, Appendices; *b*, Apex of abdomen.**

In the specimen (male) the posterior margin of the third abdominal segment is, so far as I can observe, formed like the other segments, and not produced into a median lobe, as in most of our Panorpids. The fifth and sixth segments stout and obconical, the latter is very conspicuous, and bears a short but prominent spine at the middle of the posterior margin; seventh slender, longer, and cylindrical; eighth much more slender and cylindrical and almost equal in length to the former; ninth (cheliferous segment) stout and rounded (not elongated, as in *P. japonica* and others), the chelæ shorter than the segment; appendages long and almost parallel, except towards the end, where they slightly approach each other.

Length of body, 11 mm.; expanse of wing, 15 mm.

A male specimen captured at Chuzenji, Nikko, July 27th, 1910, by Mr. Gallois Edme, of the French Embassy.

As this species is new to science, I take great pleasure in naming it after my friend, an enthusiastic collector of Coleoptera, and captor of this specimen, who was so kind as to put the specimen at my disposal to be studied and described.

To a certain degree *P. galloisi* is allied to such European species as *P. germanica*, *annexa*, and others. Of the Japanese forms, however, only *cornigera* and *gokænsis* are somewhat allied to the species; but many points, and, above all, the structure of the sixth abdominal segment distinguish it well from the other species.

Zool. Inst. Agr. Coll. Imp. University,
Tokyo, Japan: Oct. 1910.

THE DURATION OF THE LARVAL STAGE IN SOME OF THE SESIIDÆ.

By Lt.-Colonel C. G. Nurse, F.E.S.

Considering the mode of life of the larvæ of this family, it is scarcely surprising that our information regarding the duration of the larval stage is scanty and insufficient. It is impossible to watch the progress from the egg to the imago, as may be done with the greater number of Lepidoptera, where the actual number of days between the different ecdyses can frequently be calculated. The following notes are, therefore, offered with a view to inviting other entomologists to place on record their experience regarding the life-history of such species of this family as they are able to study.

The prevailing view appears to be, to quote South's 'Moths of the British Isles,' that "the majority, possibly all, are nearly two years in arriving at full growth." I have personally been able to study, very inadequately, four species, viz. *Trochilium apiforme* and *crabroniforme*, and *Sesia vespiformis* (*asiliformis*) and *culiciformis*.

Of *T. apiforme* Barrett says, "full fed in April, after feeding probably nearly two years." This is not quite accurate, as the larva ceases feeding and spins its cocoon in September or October, though it does not change to a pupa until the following April, as noted by Greene in 'The Insect Hunter's Companion.' Of the total duration of the larval stage I cannot speak with certainty, but I think it reasonable to suppose that the life-cycle extends at least two years, and I should not be at all surprised if it proved to be three years. The few specimens I have bred have all emerged in July, though Barrett gives the latter part of May and June as its period on the wing.

As regards *T. crabroniforme;* here again I cannot speak with certainty, but I have found the larva still feeding in June, and think it probable that the generally accepted opinion that it feeds nearly two years is correct.

My experience as regards *S. vespiformis* is very much more extensive, and I feel that I can state positively that this species, at any rate normally, completes its life-cycle in one year. As is well known, the larvæ are to be found under the bark of the stumps of felled oak-trees. These trees are invariably felled in the winter; the following summer the females of *S. vespiformis* frequent these stumps, especially those that produce a few shoots, though I have never been able to ascertain exactly where the egg is laid. Larvæ are to be obtained throughout the following winter and spring. To make this quite clear, I may say that the stumps of oaks felled in 1907–8 will, if the insect occurs in the neighbourhood, probably contain larvæ in the winter of 1908–9, and only in rare instances, when the stump is still alive, will a few larvæ be found in the winter of 1909–10. The larvæ seem of all sizes in April and May; indeed, I have found larvæ, pupæ, and imagines on the same day in June. When I first began to study this species, I thought that the smaller larvæ would probably only reach the imago stage in the following year. But the emergence of the imago extends over a long period, *viz.* from the end of May to the end of August. If a stump be searched, however, in the middle or end of July, no larvæ are to be found, only empty and a few full cocoons. I think, therefore, that I am justified in concluding that the life of this species, from ovum to imago, extends for only one year, and that when, in rare instances, larvæ are found in the winter of 1909–10, in the stump of an oak felled in 1907–8, they are the progeny of imagines that emerged in 1909. It is possible that, as with other species of Lepidoptera, a few pupæ, or even larvæ, may "lie over" till another year, but I am convinced that the normal period during which the larva feeds is just under one year. I may state that during the past five years I have taken over two hundred larvæ and pupæ of this species, and have purposely searched for them at different times, with a view to ascertaining the duration of the larval stage.

I have not had as extensive opportunities of investigation regarding *S. culiciformis* as with *S. vespiformis.* But the former species is to be found in the larval stage in the live stumps of birch the second spring after it has been cut, and not, so far as my experience goes, in the third spring; so I conclude that this species has also a one-year cycle.

Timworth Hall, Bury St. Edmunds: Feb. 12th, 1911.

CONTINENTAL NEUROPTERA, &c., TAKEN BY DR. T. A. CHAPMAN IN 1909 AND 1910.

By W. J. Lucas, B.A., F.E.S.

From time to time Dr. Chapman has been good enough to hand over to me a few neuropterous and other insects which he has obtained on his Continental trips. A list of those taken in 1909 and 1910 is here given. Species that are not British are marked with an asterisk. Mr. K. J. Morton has been good enough to assist me in naming them, and those insects in which he is more immediately interested are now in his cabinet.

Amelie-les-Bains, April 6th–21st, 1909, and Vernet-les-Bains, April 24th to May 9th, 1909.

Plecoptera.

**Tæniopteryx seticornis*. Vernet.

Nemoura of the group of *marginata* apparently; one each from Amelie and Vernet respectively; both, unfortunately, were females.

Neuroptera.

Hemerobius subnebulosus. Amelie.

Chrysopa aspersa. Vernet.

**Panorpa meridionalis*. Vernet.

Trichoptera.

Hydropsyche pellucidula. Amelie and Bagnial-sur-Mer.

Philopotamus montanus. Amelie and Vernet.

**Rhyacophila persimilis*. Amelie.

**Rhyacophila tristis*. Vernet.

South of France at Val d'Herens, &c. July and August, 1909.

Plecoptera. Val d'Herens: July 10th–30th.

**Dictyopteryx alpina*.

**Dictyopteryx intricata*.

**Tæniopteryx neglecta*.

**Nemoura sinuata*, and probably another species of the same genus, but all are females.

Leuctra inermis.

Ephemeroptera.

**Ecdyurus helveticus*. One male, one female, Val d'Herens: July 10th–30th.

Neuroptera. Val d'Herens: July 10th–30th.

**Raphidia flavipes*. Four females.

Micromus paganus. One.

**Megalomus tortricoides*. Seven.

Chrysopa perla. Three.

Panorpa germanica. Three males.

**Panorpa alpina*. One female.

Trichoptera.

*_Drusus discolor_
*_Drusus chrysotus_
*_Drusus alpinus_
*_Drusus muelleri_
*_Drusus melanchætes_
Val d'Herens: July 10th–30th.

*_Cryptothrix nebulicola._ Trelechant, Col de Montets: August 6th.

*_Potamorites biguttatus._ Val d'Herens: July 10th–30th.

*_Sericostoma pedemontanum._ One from Trelechant: August 6th. Four from Val d'Herens: July 10th–30th.

Plectrocnemia conspersa. One from Trelechant: August 6th. One from Val d'Herens: July 10th–30th.

*_Rhyacophila vulgaris._ Val d'Herens: July 10th–30th.

Hyeres, St. Maxime, Binn, and Hospenthal, April to July, 1910.

Plecoptera.

Nemoura mortoni. Three females, Hospenthal: July 12th–31st.

Odonata.

Brachytron pratense. One female, Hyères: April 5th–20th.

Pyrrhosoma nymphula. One male, one female, St. Maxime: April 29th–May 11th.

Neuroptera.

Sialis lutaria. Two, Hospenthal: July 12th–31st.

Raphidia notata. One male, Binn: June 20th–30th.

Chrysopa vulgaris. One, St. Maxime: April 29th–May 11th.

Trichoptera.

*_Acrophylax zerberus._ A female, Binn: June 20th–30th.

*_Drusus alpinus._ Three females, Binn: June 20th–30th.

*_Drusus nigrescens._ A male and a female, Binn: June 20th–30th. A male, Hospenthal: July 12th–31st.

*_Drusus melanchætes._ Two males and two females, Hospenthal: July 12th–31st.

*_Lithax niger._ Seven, one of small size, Hospenthal: July 12th–31st (six of them marked "Gotthard").

*_Potamorites biguttatus._ Two males, Hospenthal: July 12th–31st.

*_Rhyacophila vulgaris._ A male, Binn: June 20th–30th. [There was also a *_Sericostoma_ female (probably _galeatum_) from Le Canadel.]

Kingston-on-Thames: February, 1911.

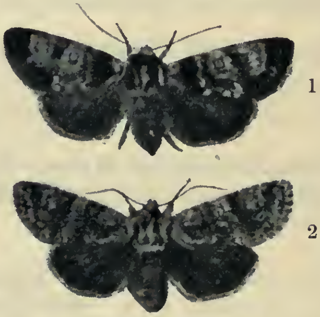
ABERRATION OF _ACRONYCTA RUMICIS_ AND _A. ALNI_.

By Richard South.

Herr M. Gillmer (Ent. Rec. xix. p. 91) describes an aberration of _Acronycta rumicis_ as follows:—"It has the basal and marginal areas of the fore wings black, the middle area scarcely darker brownish-grey than in typical specimens; the outer, light, transverse lines obsolete (or suppressed), only the white mark in cell 1 *b* (anal cell) remains; otherwise the insect is typical = ab. *suhrianna*, n. ab. This form is intermediate between the brownish-grey type and the quite black form of ab. *salicis*, Curtis. The specimen is a female, and caught in the Palatinate."

In 'Societas Entomologica,' xxiv. p. 59 (1909), Herr Gillmer figures ab. *suhrianna*, and quotes the original description, with a translation thereof in German. In a footnote it is pointed out that the outer transverse line is not so conspicuous as it appears to be in the figure.

A year or two ago Mr. T. Baxter, of St. Anne's-on-Sea, Lancashire, was good enough to send me a photograph (here reproduced) of an aberrant specimen of *A. rumicis* that he had found on the golf-links in his neighbourhood on July 4th, 1905.



Acronycta rumicis.—1, aberration; 2, normal.

This interesting example seems to be referable to ab. *suhrianna* as described above. The only apparent difference is that, whereas the basal area in *suhrianna* is stated to be black, this area in the Lancashire specimen is traversed by a broad black band which occupies only the outer two-thirds, the basal third of the area being pretty much as in normal specimens. In the figure of *suhrianna* the basal area does not show wholly black right up to the thorax.

In his note, "Captures at Sugar in Yorkshire" (Entom. xliii. p. 228), Mr. Bunce refers to one of the three specimens of *Acronycta alni* as "strongly inclined to melanism." I lately had an opportunity of seeing this specimen, and found it to be an unusual (British) aberration of *A. alni*, closely approaching ab. *steinerti*, Caspari. It may be briefly described as follows:—Head and thorax blackish, the former narrowly edged with greyish, the latter with a few greyish hairs. Fore wings brownish grey, suffused with smoky; black markings as in the type, but the antemedial black line is rather broader; postmedial and submarginal lines a paler shade of the ground colour, the former narrowly edged externally with black; orbicular stigma of the ground colour with black centre and outline; reniform black with faint outline of ground colour, mixed, in upper portions, with black.

According to Staudinger (Cat. Lep. 1901, vol. i. p. 132, No. 1082), figures of *steinerti*, Caspari, described in 1898 ('Societas Entomologica,' xiii. p. 3), are given—Jahrb. Nass. lii. pl. 4, figs. 8, 9; 'Iris,' xi. pl. 2, fig. 5; as *carola*, Phillips, Jahrb. Nass. lii. pl. 4, figs. 5–7; and as *alni* var. by Barrett, Brit. Lep. iii. pl. 121, figs. 1*a*, 1*b*. The last two seem to be modifications of *steinerti*, as also is the specimen secured by Mr. Bunce. The latter, however, appears more heavily suffused than either of the others.

HYBERNATION OF *PYRAMEIS* (*VANESSA*) *ATALANTA* IN CAPTIVITY.

By L. W. Newman.

In the autumn of 1909 I saved seven specimens of *Pyrameis* (*Vanessa*) *atalanta* to see if it were possible to hybernate them in England under unnatural conditions.

I have many times tried them out of doors, also in a cold greenhouse, but in both cases failed, the specimens dying off early in the winter.

I prepared a small cardboard box about nine inches by six inches by six inches deep, cut out the lid, leaving only the frame of cardboard, stretched open mosquito netting over the box, and held this down with the cardboard frame.

The butterflies were placed in this, the box stood by a window facing east, and at night removed to a warmer quarter of the room; there was always a fire in the room, and also a large boiler which was warm all night, so that the specimens never had a lower temperature than, say, 35 degrees, even on the coldest nights. After two or three days they became very restless, and evidently required food. A good-sized pad of absorbent cotton-wool was well soaked in water, sprinkled with cane-sugar, and placed in the centre of the box on top of the mosquito netting; very soon the butterflies had found the sweets and were busy feeding. They walked about in the box, continuously opening their wings when the sun was shining, and about midday retired to the darkest corner of the box.

Throughout the whole winter they fed regularly every few days, and on no day when there was any sun did they remain quiet, no matter how cold the weather was out of doors.

The first casualty happened in December, when a male specimen became quite paralyzed; he seemed to have indulged too freely in food, for his body became very distended, and he lay for many hours at the bottom of the box with legs twitching and wings quivering before he died.

In January the specimens became very tame, and it was my habit to let them fly about in my room on sunny mornings; they would settle on the curtains with wings expanded and sun themselves; they would also feed from my hand, and enjoyed a piece of apple with sugar sprinkled on it, or a banana; they seemed to like the extra space, and the exercise I thought would keep them strong, as they took so much food.

In February I lost a second specimen, which flew into the fire; this left me with only five. All went well, and no more met with unhappy endings during that month.

Early in March I placed them out of doors in the daytime, confined in a roomy cage under a glass-roofed house with open sides, and gave them a pot of growing nettle. No sign of pairing was noted, but in early May a fair quantity of ova had been deposited; these, however, proved infertile, and on examining the specimens I found all were females, the only two males having been the victims of the winter; this greatly disappointed me.

The last specimen lived till the end of May.

I think these observations clear up a point which has long been in doubt, and prove that *atalanta* is not a true hybernator, as it requires food all the winter, consequently this species very seldom, if ever, passes the winter as imagines in England; we are, therefore, entirely dependent on immigration every year for this beautiful though common butterfly.

1910 was a very bad *atalanta* year. Personally, I saw only two specimens on the wing and found but one larva, and heard of very few larvæ or imagines having been seen in England during the year.

I had six pupæ sent to me from Devonshire; these I bred out, and have the imagines alive. Mr. T. Reuss has sent me eight living specimens, two of which met with an accident a few days after arrival, so this winter I have twelve specimens, and with these few I hope to be able to clear up a further point next spring, and that is, to find out whether the species pair in early spring. I have noticed no sign of autumnal pairing.

Bexley, Kent.

THE HUMBLE-BEES OF FORMOSA.

By T. D. A. Cockerell.

Having received from the British and Berlin Museums a large series of Formosan *Bombi*, I have thought it opportune to present an account of the species of that island, all of which appear to be endemic.

Bombus wilemani, n. sp.

Worker; length 15 mm.; black, the pubescence black, rust-red on abdominal segments 3 to 6, above and below; the small joints of the tarsi also have reddish hair, and it is ferruginous on the inner sides of the middle and hind basitarsi, except the base of the former; head elongate, malar space longer than broad; eyes dark greenish; nodules of labrum low; fourth antennal joint very short, broader than long, not quite half length of third; ocelli small; tegulæ dark brown; wings pale reddish, the apical margin not conspicuously darker; nervures relatively slender, ferruginous; second and third abdominal segments with a few pale hairs in the middle.

Female; length 21 mm., width of abdomen 8; otherwise similar to the worker.

Hab. Formosa (A. E. Wileman). British Museum. This species is closely related, both in structure and colour, to *B. pomorum* of Europe. It is also related to the Formosan *B. bicoloratus*, but is smaller, with much more delicate venation. The similar-looking Japanese *B. andreæ*, Friese, is related to *B. pratorum*, and therefore structurally distinct from *B. wilemani*. I have taken the worker, *B. wilemani*, as the type, since the female is in bad condition. Both specimens bear a written label, "Arizan, ix. 11, 1906, 7500 feet," and a printed one, "Tainan, Anping, S. Formosa."

Bombus bicoloratus, Smith, 1879.

From the Berlin Museum I have two females, four hermaphrodites, collected by Sauter in Formosa. Two of the workers are labelled "Kanshirei, 8. 6. 08."

Bombus bicoloratus var. *fulvolateralis*, n. var.

Worker; meospleura with the hair pale brown instead of black. Three collected by Sauter in Formosa; two are from "Kanshirei, 8. 6. 08." Berlin Museum.

Bombus latissimus, Friese, 1910.

This very fine species has only lately been described. A female from the British Museum was collected by Wileman at the same place as the types of *B. wilemani*, but on September 27th. From the Berlin Museum come one female and eleven workers collected by Sauter. One of the workers has red hair on each side of the first abdominal segment posteriorly. Only one Sauterian specimen has the exact locality specified; a worker from Chip Chip, S. Formosa, February, 1909. At first sight it might seem that *latissimus* was only a variety of *B. bicoloratus*, but it is certainly a distinct species, differing in its broader abdomen, the abundant red hair of legs, the apical dark band of anterior wings with its inner margin fairly straight (in *bicoloratus* it is conspicuously undulated or lobed), and in having the fourth antennal joint much longer than broad (in *bicoloratus* the fourth joint is short, hardly or not longer than broad).

A female of the Japanese *Megachile doederleinii*, Friese, was taken by Mr. Wileman in Formosa, and bears the label, "Kozensho, Ko-tan-kgan, 6000 ft., ix. 7, 1096." It is about 21 mm. long—distinctly smaller than a Japanese example in my collection. I suspect that this species has been introduced into Formosa, as it is wholly absent from the large collection made by Sauter. There is in the Sauter collection a related species with much shorter mandibles.

CHESHIRE AND SOUTH LANCASHIRE ODONATA.

By W. J. Lucas, B.A., F.E.S.

Recently I have seen a collection of dragonflies from Warrington, some belonging to the Municipal Museum, the remainder from Mr. G. A. Dunlop's collection. I record such of the local ones as bear date and locality labels.

Leucorrhinia dubia. Abbot's Moss, Cheshire: July 4th, 1908; July 2nd, 1909; August 1st, 1910.

Sympetrum flaveolum. A male, Flaxmere: August 5th, 1907.

Sympetrum scoticum. Flaxmere, Cheshire: August 5th, 1907; August 3rd, 1908. Abbot's Moss: July 4th, 1908; August 1st, 1910.

Calopteryx virgo. Amongst a number of *C. virgo* and *C. splendens*, usually without labels, is a specimen of the former species, which appears to be var. *anceps.* Whether this is a North Country specimen I cannot say.

Lestes sponsa. Abbot's Moss: July 4th, 1908; August 1st, 1910.

Pyrrhosoma nymphula. Frodsham, Cheshire: June 9th–10th, 1902; July 18th, 1908; June 22nd, 1910.

Ischnura elegans. Flaxmere: August 5th, 1907. Padgate, South Lancashire: June 16th, 1909. A specimen bred out in the Museum; May 18th, 1909.

Agrion pulchellum. Frodsham: June 9th–10th, 1902.

Agrion puella. Frodsham: June 10th, 1902. Grappenhall, Cheshire: June 23rd, 1906. Padgate: June 16th, 1909.

Enallagma cyathigerum. Abbot's Moss: July 4th, 1908.

Perhaps the most interesting specimen is *S. flaveolum*, but being a male it is most probably a migrant. Mr. Dunlop will no doubt be able to satisfy himself as to whether it breeds in the Delamere Forest District or not. In the collection are two specimens of *Agrion pulchellum*, labelled "New Forest, 9 July, 1895." This species has not, I believe, been recorded for the New Forest, and the record would have been of interest; but, unfortunately, the specimens were bought at Stevens', and nothing further is known about them. Mr. Dunlop tells me in addition that *Æschna grandis* and *Æ. cyanea* occur very commonly in the district, even flying about the streets of Warrington, and that *Agrion puella* is common on the Old Quay Canal, Acton Grange, Cheshire.

Kingston-on-Thames: February, 1911.

HATCHING OF THE EGGS OF *ARGYNNIS LAODICE*.

By F. W. Frohawk, M.B.O.U., F.E.S.

In the 'Entomologist' for March, 1909, I published an account of the life-history of *Argynnis laodice*, wherein I stated that the larvæ remain developed within the egg throughout the winter and emerge therefrom in the early spring. This statement M. Gillmer contradicts in his review (' Societas Entomologica,' xxiv. nos. 4–5) of the life-history, maintaining that the larvæ in a state of nature emerge from the eggs in the autumn. Subsequently I pointed out in the 'Entomologist,' October, 1909, p. 258, that I felt convinced M. Gillmer was wrong in his assertion, and that if any eggs emerged in the autumn this was due to the fact that the eggs in question were kept more or less under artificial conditions.

The Hon. N. Charles Rothschild, to whom I am indebted for the original eggs, now kindly tells me that he has received more than one hundred eggs of *A. laodice* during January of this year, from M. Kieselbach (living in Koenigsberg, where this butterfly is common), who has informed him that, out of a number of eggs deposited by a single female *laodice*, some hatched in the autumn, while others passed through the winter in the egg state, the young larvæ only making their egress from the shell in the spring. He further states that, in his opinion, the larvæ that emerge in the autumn are induced to adopt that course when kept under artificial conditions, although exposed to the cold; he also seems more or less convinced that in a state of nature the larvæ do not emerge from the eggs until the spring.

By this statement M. Kieselbach's opinion exactly coincides with my own.

It may be noted that *A. laodice* very closely resembles *A. paphia* in all stages of the larva, and the pupæ of both are so similar that they are almost indistinguishable. But the eggs of the two species differ: that of *laodice* bears a close resemblance to the egg of *A. adippe* in form and general structure, as well as the period of hatching. The latter are laid during July and August, and hatch about the beginning of the following April, while the eggs of *A. paphia* remain only about fifteen days in the egg state, hatching during August, when the young larvæ immediately enter into hybernation, without feeding on anything more than that portion of the eggshell which they eat away to allow of their emergence; they simply rest near the empty shell until the following spring, usually awakening at the end of March or early in April.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. Distant.

Fam. PENTATOMIDÆ.

Elasmucha tauriformis, sp. n.

Olivaceous-brown, the corium more olivaceous, the membrane pale olivaceous-brown; head sparsely coarsely punctate, the lateral margins sinuate, the lobes subequal in length, the central lobe almost impunctate; antennæ piceous, basal joint not reaching apex of head, second and third subequal in length, each much longer than first, remaining joints mutilated in type; pronotum rather sparingly but very coarsely punctate, the punctures somewhat confluent near anterior margin, the lateral angles longly, robustly, transversely produced, their apices finely, acutely narrowed, the posterior angles distinctly, rather broadly posteriorly produced; scutellum sparingly, coarsely punctured; corium very obscurely finely punctate; membrane not passing the abdominal apex; head beneath and sternum olivaceous-brown, sparingly, coarsely punctate, mesosternal process not reaching the anterior margin of the prosternum and backwardly produced between the intermediate coxæ; abdomen beneath greenish-olivaceous, abdominal spine almost reaching the intermediate coxæ, an obscure central longitudinal ridge, angles of the posterior segment broadly subprominent, rostrum about reaching the posterior coxæ. Long. 9½ mill. Exp. pronot. angl. 8 millim.

Hab. Punjab; Murree.

The longly and apically spinously produced lateral angles of the pronotum is a distinctive feature of this species.

Elasmucha montandoni, sp. n.

Ochraceous, coarsely darkly punctate; produced pronotal angles carmine-red; scutellum with a large basal central oblong black spot; head coarsely punctate, the lateral margins almost impunctate; antennæ mutilated in typical specimen; pronotum coarsely punctate, the punctures somewhat confluent near anterior margin, lateral margins almost impunctate, a few punctures in linear series on their anterior areas, the lateral angles produced and apically recurved, their apices shortly subacute, posterior angles distinctly but shortly and obtusely backwardly produced; scutellum sparingly punctate, more thickly so on lateral margins, about apical fourth distinctly narrowed; corium coarsely punctate; membrane slightly passing the abdominal apex; body beneath ochraceous; prosternum more or less coarsely darkly punctate; mesosternal process not reaching the anterior margin of the prosternum; abdomen with a transverse reddish-brown streak on each side of the fourth and fifth segments, two pale levigate ochraceous streaks on each side of the sixth segment, spiracles piceous; posterior angles of the anal segment in female moderately produced, curved, and carmine-red; abdominal spine scarcely passing the posterior coxæ; rostrum shortly passing the posterior coxæ. Long. 7 millim. Exp. pronot. angl. 4½ millim.

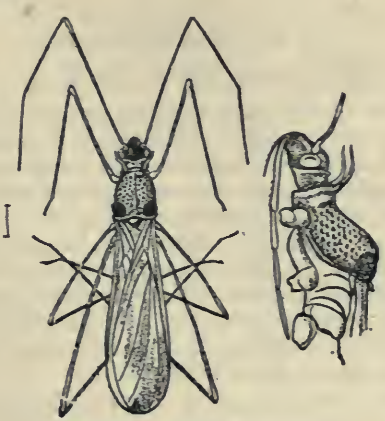
Hab. Bengal; Kurseong.

Dr. Montandon sent me a single specimen of this beautiful species.

Fam. BERYTIDÆ.

Metacanthus bihamatus, Dist., Ann. Soc. Ent. Belg. liii. p. 360 (1909).

Hab. Ceylon.



METACANTHUS BIHAMATUS.

I take the present opportunity to figure this species. By the long hooked spines to the pronotum it is somewhat aberrant to the genus.

Gen. TAPROBANUS (*ante*, p. 24).

Although carefully shown in the sectional figure of the typical species (*ante*, p. 25), the generic diagnosis did not refer to the character of *a curved, upwardly directed, slender process on each side of the sternum between the intermediate and posterior coxæ.*

Fam. LYGÆIDÆ.

Macropes rufipes, sp. n.

Head, pronotum, and scutellum black; corium ochraceous, more or less streaked with piceous; membrane very pale ochraceous with the veins darker; body beneath black, the legs reddish-ochraceous; antennæ black, the first, second, and third joints more or less ochraceous, the apices of the second and third joints distinctly clavate and black at apices; pronotum broadly distinctly transversely impressed a little before base, before this a little convex and irregularly impressed, the lateral margins moderately rounded, the basal margin moderately concave, the whole very finely punctate; membrane extending to a little beyond the middle of the abdomen; connexivum dull ochraceous; abdomen above black, finely ochraceously pilose; body beneath black, very finely ochraceously pilose. Long. 7 to 8 millim.

Hab. Bengal; Kurseong.

Allied to *M. punctatus*, Walk., but differing by the pronotum being less deeply concave at posterior margin; the second and third joints of antennæ distinctly clavate at apices; different colour of the legs, &c.

I am again indebted to Dr. Montandon for specimens of this species.

Fam. HENICOCEPHALIDÆ.

Henicocephalus limbatipennis, sp. n.

Head, anterior lobe of pronotum, scutellum, body beneath, and legs ochraceous; antennæ, and middle and posterior lobes of pronotum, castaneous; abdomen beneath with transverse fuscous markings; hemelytra pitchy-brown, a basal angulate spot ochraceous, the lateral and apical margins broadly sordidly stramineous; antennæ distinctly pilose, second joint distinctly longer than the third; anterior lobe of head considerably longer than posterior lobe, elongate, margins subparallel, posterior lobe globose, the ocelli near its anterior margins; posterior lobe of pronotum distinctly wider than middle lobe, its lateral margins roundly oblique, middle lobe centrally longitudinally sulcate. Long. 8 millim.

Hab. Ceylon; Peradeniya (F. H. Gravely, Ind. Mus.).

Mr. Gravely found this species "running about on the ground in the jungle."

Allied to *H. majusculus*, Dist., but a smaller species, differently coloured, the pale lateral margin to the hemelytra broader and regularly continued to the apex, basal joint of antennæ shorter and more incrassate, middle lobe of pronotum with the lateral margins rounded, not obliquely narrowed anteriorly, &c.

Fam. REDUVIIDÆ.

Acanthaspis chilawensis, sp. n.

Black; antenniferous tubercles, spines at base of pronotum, basal angles and a large spot behind middle of corium, and lateral marginal spots to abdomen above and beneath, ochraceous; legs pitchy-brown; first joint of antennæ about as long as head; anterior lobe of pronotum sculptured, the anterior angles subprominent, posterior lobe closely rugose, lateral spines somewhat long, a little directed backward, their apices black, the two central basal spines much shorter, posteriorly directed; scutellum with a long spine obliquely directed backward; legs finely setose; rostrum reaching the anterior coxæ, first and second joints subequal in length. Long. 16 to 20 millim.

Hab. Ceylon; Chilaw (E. E. Green).

Closely allied to *A. quinquespinosa*, Fabr., but basal central spines to pronotum smaller, their basal areas black, not ochraceous, spot to corium larger, less transverse, and more oblong, &c.

Genus AMULIUS.

Amulius viscus, sp. n.

Head and antennæ black, the latter with the base of third joint (rather broadly) and base of fourth joint (narrowly) ochraceous; pronotum pale sanguineous, the anterior angles, some central suffusions to anterior lobe and the posterior lobe—excluding lateral areas—black; scutellum and corium black, apex of the former and a spot on apical area of the latter, ochraceous; membrane shining bluish-black; connexivum black with large pale sanguineous spots; a central longitudinal fascia to head beneath, ochraceous; sternum pale sanguineous, disks of meso- and metasterna and lateral areas of the latter, black; four spots near anterior margin of mesosternum ochraceous; abdomen beneath dull ochraceous, connexivum as above and a series of large sublateral spots black; legs ochraceous or pale sanguineous, a broad central annulation and apex to anterior tibiæ, apical areas of intermediate and posterior femora, the intermediate and posterior tibiæ and all the tarsi, black; rostrum black, about or almost reaching base of head; antennæ with the first joint less than half the length of head, second nearly as long as pronotum, third longer than fourth; anterior angles of pronotum long, spinously produced, the spines forwardly produced, curved, and slightly longer than first joint of antennæ, basal pronotal margin posteriorly laminately produced and strongly centrally emarginate; apex of scutellum somewhat tuberculous. Long. 19 millim.

Hab. Ceylon; Ratnapura (E. E. Green).

Allied to the Malayan *A. quadripunctatus*, Stål, but the anterior spinous pronotal angles black, much more slender, acute, and curved, &c.

"In life—has the anterior tarsi covered with a viscid secretion resembling Canada balsam. In living examples the red areas are quite brilliant" (E. E. Green *in litt.*).

Fam. NOTONECTIDÆ.

Anisops ali, sp. n.

Ochraceous, the hemelytra more or less shaded with fuliginous; eyes black; interocular space narrow, margins parallel, not or very slightly narrowing at base, above with a distinct central longitudinal impression, the margins of which are ridged, beneath narrow, parallel, of the same breadth throughout; pronotum with a distinct waved carinate line on the anterior area, commencing on the lateral margins behind eyes and then roundly directed upward and united between the inner posterior angles of the eyes; abdomen beneath fuscous. This species is allied in general coloration to *A. sardea*, Herr.-Schaff., and *A. fieberi*, Kirk. From both of these, however, it is distinctly separated by the narrow parallel interocular space, and by the distinct carinate waved line to the pronotum. Long. 5 to 6½ millim.

Hab. Ceylon; Diyatalawa (E. E. Green).

NOTES BY THE WAY.

The restriction of the terms "type" and "co-type" to definite limits is an exceedingly simple matter, if we could but agree as to the limits. A world-wide authority in his particular order startled me to-day by stating that "co-type" could be applied to any specimen pronounced by the original describer to be co-specific with the type—that, in fact, you sent him a specimen, captured years after the description was published, he compared it with the type, returned it to you as co-specific, and you became, in consequence, the happy possessor of a "co-type"! Even "type" has a vague meaning for some authors. Two "types," both so labelled similarly by the author, were sold to a museum; one was from Ceylon, and the other from Kuching; his description gave "Kuching" as the only original locality—the sale of the Ceylon specimen as a type was, to say the least, irregular. "Co-types" are all the specimens of a single species immediately before the author when he draws up his description. The "type" is a single specimen selected at will by the author as most typical of this whole series of individuals.

A nice point of synonymy was raised recently, for which we have no recollection of provision by the British Association or Zoological Congress:—If an author publish a specific name already figuring in the same genus, and a second man subsequently publish a description of the same species and make for it a new and valid genus, does the first name, which is not truly co-specific with the other species as placed, take priority in the second author's new genus?

In our last we mentioned Irish entomological research; but a much more elaborate exploration has been going on respecting the insects of that very interesting group of islands off Madagascar known as the Seychelles. Prof. Stanley Gardiner, well known for his investigations in the Maldive and Laccadive Islands, will shortly publish a detailed description of them, but we have already arrived at the third volume of the general account of the fauna collected there during 1908 and 1909 by Mr. Hugh Scott, the Curator at Cambridge. This is given through the medium of the Trans. Linn. Soc. of last November, and graphically introduces us to the sterile granitic rocks, rising in places to an altitude of two to three thousand feet. It is a most fascinating locality, since "there are well-marked distinctions between the entomological faunas of different parts," many species are obviously introduced, and there is a distinct Oriental element; forests at an elevation of some thousand feet were found most productive of truly indigenous species.

C. M.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 62.)

Mithuna arizana, sp. n.

♂. Antennæ fasciculate; head and thorax pale brown, abdomen paler. Fore wings pale brown, darker freckled; medial line dark brown, slightly oblique, interrupted above the middle; submarginal line dark brown, rather broad, much interrupted. Hind wings fuscous, outer margin and fringes yellowish.

♀. Similar to the male, but the medial line of fore wings is entire; hind wings paler than those of the male.

Expanse, 24 millim.

Collection number, 694.

One example of each sex from Arizan (7500 ft.). The male captured in September, 1906, and the female in August, 1908.

ab. *parva*, nov.

Smaller, the medial line of fore wings only distinct on the costa and the inner margin; the submarginal line less distinct and nearer the outer margin.

Expanse, 18–19 millim.

Two male specimens from Kanshirei (1000 ft.), June 13th, 1906.

Possibly these insects may be local forms of *M. quadriplaga*, Moore.

Ilema tricolor, sp. n.

Fore wings pale cinnamon-brown on basal two-thirds, blackish on outer third. Hind wings creamy white, a blackish border on the outer margin; the latter is broadest towards costa, slightly indented below middle, and narrowed at anal angle. Under side as above, but the basal two-thirds of fore wings creamy white, and the costal margins of all the wings streaked with yellow.

Expanse, 28 millim.

Collection number, 542 *a*.

One male specimen from Rantaizan (7500 ft.), May 13, 1909.

Siccia taiwana, sp. n.

Head and thorax white, faintly tinged with brown. Fore wings white, powdered with pale brownish chiefly on costal area; a black point near base of costa and a black mark below it; three blackish spots on the costa, from the first are traces of an antemedial line, and from the third a curved series of dusky dots (the second from inner margin bar-like) represent a postmedial line; a blackish spot at end of cell, and a dot about middle of cell; submarginal line dusky, slender, with blackish dots upon it; a blackish dot on the whitish fringes at apex, and a similar one about middle. Hind wings pale fuscous. Under side whitish; fore wings clouded with fuscous; hind wings with blackish discoidal dot and a dusky band beyond.

Expanse, 22 millim.

Collection number, 678.

One male specimen from Kanshirei (1000 ft.), August 19, 1905.

Nudaria (?) *semilutea*, sp. n.

Fore wings white; basal area, except extreme base, orange-yellow, limited by a partly curved line of the ground colour; the outer area clouded with dark brown. Hind wings whitish, faintly tinged with yellow; a dark cloud on outer margin towards the costa.

Expanse, 16 millim.

Collection number, 699.

One male specimen from Kanshirei (1000 ft.), June, 1906.

Chamaita hirta, sp. n.

♂. White, semi-transparent, the veins of fore wings clothed with brownish hairs, except on outer third (perhaps denuded).

♀. Whitish, semi-transparent, obscurely mottled with brownish (? stain).

Expanse, ♂ 18 millim., ♀ 18–20 millim.

Collection number, 681.

One example of each sex from Kanshirei (1000 ft.), May, 1906, and a female specimen, from the same locality, taken in August of that year.

Near *C. nympha*, Moore.

Hyposiccia dentata, sp. n.

Head and thorax dark brown, abdomen paler. Fore wings whitish, suffused with pale brown; basal third dark brown, hardly separate from a dark brown, dentate, antemedial line; medial and postmedial lines dark brown, dentate, space enclosed by the lines suffused with the darker colour; a black curved spot at end of cell, where the medial line is bent outwards, and a dot in the cell; submarginal line dark brown, interrupted, broadest towards costa; fringes whitish, preceded by a series of dark brown dots. Hind wings fuscous, fringes paler. Under side fuscous, costal and outer margins of fore wings and fringes of all wings paler.

Expanse, 18 millim.

Collection number, 698.

One male specimen from Tainan (on the plains), May 14, 1906.

Near *H. mesozonata*, Hampson.

Asura limbata, sp. n.

♂. Antennæ whitish above, reddish beneath; head and thorax white, the latter marked with brownish. Fore wings brownish, a black dot at end of cell, from which a black streak runs towards base of the wing; a subbasal line runs to a white streak on the inner margin, thence turns upward, forming a white hook-like mark; outer margin with white border, enclosing three brownish spots on the upper portion. Hind wings paler, with an interrupted white border on the outer margin.

♀. Paler, but this is probably due to its worn condition.

Expanse, ♂ 22 millim., ♀ 24 millim.

Collection number, 695*a*.

One specimen of each sex from Kanshirei (1000 ft.). The male captured in April, 1907, and the female in May, 1908.

Asura pica, sp. n.

♀. Fore wings blackish with a white hook-like mark as in *limbata*, but the streak is more oblique to inner margin, and is twice interrupted near the costa; the white outer border of *limbata* is here represented by four white spots—one on the costa before apex, one at apex, one at middle, and one at the inner angle; all four united by a slender, wavy, submarginal white line. Hind wings blackish.

Expanse, 18 millim.

Collection number, 695.

One female specimen from Kanshirei (1000 ft.), September 22nd, 1906.

May be a seasonal form of *A. limbata*.

NOTES AND OBSERVATIONS.

Hydrilla palustris, &c., at Wicken.—Though it is, perhaps, rather late in the day to tell of last summer's captures, it may be well to record that I was fortunate enough during a visit to Wicken in June to take two male specimens of *Hydrilla palustris*. I believe four other specimens were taken about the same time by other collectors. Considering the amount of wind, oftentimes from the east, we had during our stay of nearly three weeks, my friend (the Rev. J. W. Metcalfe, of Ottery St. Mary) and I did fairly well. *Arsilache albovenosa* was not much in evidence, but I had never on my two previous visits seen so many *Macrogaster castaneæ* (*arundinis*) on the sheet, or such abundance of *Meliana flammea*. Four hard days' work at Tuddenham produced only about two dozen *Acidalia rubiginata* between us; *Lithostege griseata* was almost over, but *Agrophila trabealis* was plentiful. In exploring for *L. griseata* we came upon a fresh locality for *A. trabealis* which promised well, but the presence of an irate farmer who would not listen to reason made future visits undesirable. The pine trees at Tuddenham are well-known as the resting place of *Hecatera serena*, but our experience was that the trees were quite deserted for the flowers of the viper's bugloss (*Echium vulgare*) which was growing in great profusion on the hillside. I took an entirely new series from the flowers, the moths settling quietly in brilliant sunshine. The Rev. J. W. Metcalfe was fortunate enough to take a specimen of *Dianthœcia irregularis* in the same way. The weather was fine during the whole of our stay except for one night when a thunderstorm was imminent, so much so as to drive us home in haste, only to find that it had left Wicken practically untouched in its course, and to have the mortification of knowing the next morning that the previous night had been entomologically *the* night of the season. The continuance of wind, however, was a serious disadvantage.—Rev. J. E. Tarbat; Fareham, Hants.

UNUSUAL EMERGENCE OF NOCTUA PLECTA.—On February 7th I found a perfectly fine specimen of *Noctua plecta* in the vestry of the church. The larva had probably pupated in the vestry in the autumn, and the warmth of the church had caused the imago to emerge at this early date.—Rev. J. E. TARBAT; Fareham, Hants.

UNRECORDED OCCURRENCES OF EUVANESSA ANTIOPA.—Possibly some light is thrown upon the question of the identity of the larvæ referred to as those of the Camberwell Beauty, in the quotation under the above heading, given by Mr. Rowland-Brown (*antea*, p. 68), by the following note which occurs in Humphreys and Westwood's 'British Moths,' vol. i. p. 91, where it is stated of the larva of *Porthesia chrysorrhœa*, L.:—"It feeds on various plants, especially whitethorn, in June, and has at times become so remarkably abundant as to cause a serious panic to Londoners, especially in 1782, when prayers were offered up in the churches against the enemy; and the churchwardens and overseers of the neighbouring villages, after offering rewards for collecting these caterpillars, attended to see them burnt by bushels." It will be noted that both the date and the measure by which the quantity of the caterpillars was estimated are the same in the two accounts, and I think we should not be far wrong in assuming that Professor Hall Griffin's Camberwell Beauty caterpillars were none other than those of *Porthesia chrysorrhœa*.—ROBERT ADKIN; Lewisham, Feb. 1911.

WITH regard to Mr. Rowland-Brown's interesting reference in your last number to the abundance of larvæ in Camberwell, in 1782, I think there is little doubt but that they were *Stilpnotia salicis*, for I have met with them abroad—practically in thousands. Yet another species must be taken into consideration, viz. *Malacosoma neustria*, the larvæ of which many years ago (I am speaking of the fifties and early sixties) occurred in the greatest abundance. Trees in orchards, I can remember, were often denuded of their leaves, such were their ravages. My earliest recollections in entomology are associated with collecting the "rings" of ova of this species. With regard to *Vanessa antiopa*, in my experience the larvæ are essentially sallow feeders. I have found them in Spain and commonly in the South of France but always on sallow. It is true the imagines frequent willows, but is it not the *Cossus* and other exudations which attract them?—A. H. JONES; February 4th, 1911.

AUTUMNAL EMERGENCE OF POLYGONIA C-ALBUM, var. HUTCHINSONI.—During Sept. 1910, I sent the Rev. Alfred Stiff, of Leigh-on-Sea, some two dozen larvæ of *c-album* which I had bred from Wye Valley stock. During January of this year he wrote to me and said he had been most successful with them, and had bred four specimens of the var. *hutchinsoni*, which emerged mid-October. This seemed to me very strange, as none of the remainder of the brood in my hands had produced the variety, and I had never had, nor heard of the variety being bred in the autumn, it being purely a June or early July form. I had bred some of the new straw-coloured variety, unheard-of before this year, and rather expected that he had mistaken these for var. *hutchinsoni*. I therefore asked him to let me see the specimens, and greatly to my surprise found they were very fine and large var. *hutchinsoni*.—L. W. Newman; Bexley, Kent.

Late Autumn and Winter Emergence of Ematurga atomaria.—During 1910 I reared a considerable number of *E. atomaria* from ova from Lancs. parents; the larvæ fed up rapidly and pupated in June. During July I turned out my breeding pots, collected the pupæ and stored them away in glass-top metal boxes, in as cold a place as possible for the winter. I did not again look at the pupæ till September, when I was rather surprised to find six specimens had emerged, two being dead and the other four alive. I noticed several dozens were forming up, so these were removed to a breeding cage, and the imagines duly emerged. As others continued to form up, they also were removed from their cold place and kept warm. Moths continued to emerge right up to the beginning of January, when they stopped. In all, over twenty-five per cent. of the pupæ emerged from September to January, a few almost every day.—L. W. Newman; Bexley, Kent.

Phasgonura viridissima (Orthoptera).—Mr. B. S. Williams sends me a fine female specimen of this grasshopper, that Surrey may no longer bear the reproach of having no certain record of this fine species. It was taken by himself at Pickett's Hole, Ranmore, August 13th, 1910.—W. J. Lucas.

Hemerobius stigma (Neuroptera).—On January 29th last, a specimen of this brown lacewing was obtained by beating a young Scotch fir at the Black Pond, Esher Common, Surrey. I have found the species previously in this locality in mid-winter; but still the capture may be worth recording.—W. J. Lucas.

Triphæna pronuba in January.—This evening (Jan. 27th) I took a *T. pronuba* flying around a lamp in a room. The specimen seemed to me to be too fresh for one of the partial second brood of September, 1910. Last October I found several larvæ of this species, in the garden here, nearly full-grown and still feeding. Is this a common occurrence?—Laurence Jones; The Rectory, Marks Tey.

Notes on Chilosia grossa, Cordyceps, and Smerinthus tiliæ.—Reading the note on *Chilosia grossa* by Lt.-Col. Nurse ('Entomologist,' vol. xliii., p. 313) reminds me that, under the same circumstances, I used to come across pink larvæ about one-third of an inch long. If I remember rightly, there were several in one stem. I am afraid I did not trouble much about rearing them—probably I may be told they were some commoner well-known insect. This was when I was living near Plymouth. The illustration of *Cordyceps militaris* (*l. c.* p. 297) recalls the gruesome appearance of a large *C. ligniperda* larva I left in a cylindrical tin and neglected. As well as I can remember, the fungus was nearly an inch long and growing vertically from the whole length of the back. The damp atmosphere of the tin had evidently suited the fungus better than its host. Mr. Arkle's note (*l. c.* p. 294) that *S. tiliæ* is very rare in the Chester district is equally true of the Plymouth one, where I could never succeed in finding the species, though I used to dig up the pupæ fairly freely around elms about Oxford. Around Plymouth *Sphinx ligustri* seemed to be the commonest "hawk moth." A catalogue giving the distribution of the various "hawk moths" in the several counties would be highly interesting.—(Rev.) FRED. JULIAN BRIGGS; Codrington College, Barbadoes, November 26th, 1910.

NOTES ON THE LIFE-HISTORY OF ANTITROPA ERINNYS.—The eggs are greyish white in colour, and are laid in great numbers on both sides of the leaves of a lily (*Dracæna hookeriana*) that grows wild in the woods and elsewhere. The leaves of this plant are about two to two and a half inches in width, and very thick; consequently the young larva when it emerges must be very strong, for as soon as it is hatched it at once eats a small portion of the leaf at the edge, and then turns down the same completely over itself, joining it firmly together with white silky thread. It is then light green in colour, with a black head. It comes out of its house to eat, and after about five days it closes up each end of the same and remains therein for about two and a half to three days whilst it changes its skin; it is then green in colour, with a yellow head with six false eyes on the same, black in colour. After moulting, the larva frequently occupies the old house, if large enough; if not, it makes another, going through the same operation as before, but turning over a larger portion of the leaf. After about eight days it again changes its skin; it is then much paler green, head yellow with a brown line down the centre, which widens at the mouth; the six false eyes which are black are placed two on each side of the brown line on the front of the head and one on each side of the same. The larva now measures about three-quarters of an inch in length and eats freely, but returns very quickly to its house, always backwards, if disturbed whilst feeding. Seven days later it again changes its skin, and remains in the following state until it pupates (as the last two stages are practically identical in colour and markings): the body very nearly white and very transparent; there is a black line between the second and third segments, and between the eighth and ninth segments; on the back there is a light yellow round spot, and on the last segment above the hind claspers there is a hard yellow patch very similar to the brown one in *Plœtzia fiara*. Head large and yellow in colour, with the brown marking more distinct and forming a triangle above the mouth; the six false eyes black in colour and much larger. When full grown it is a little over two inches in length. I may mention that it always comes out of its house to drop its frass. When about to pupate, which it does sometimes in its last house, it completely covers in each end of the same—the part whence the perfect insect emerges with white silk, while the old cast skin fills up the other end. Sometimes it pupates on the under side of the leaf, and then it spins a lot of white silk on that portion of the leaf and fixes itself with a band across the centre of the body. It changes in about three to four days to a very fine pupa, which is pale bluish-white in colour and has the end of the abdomen very pointed; there is a straight black line down the middle of the thorax; the six false eyes are replaced by black spots on the pupa; the case enclosing the trunk, which is only fixed to the pupa as far as the end of the wing cases, is very long, extending about a quarter of an inch below the end of the pupa. It remains about twenty-one to twenty-eight days in this state. There is no doubt this species is very badly attacked by ichneumons, and also by dipterous flies, in all its stages, including the ovum. It is also eaten, whenever caught outside its house, by ants, mantis, cockroaches, &c., more particularly in the first two stages. The butterfly is fairly common, and has been fully described by Mr. Roland Trimen.—GEO. F. LEIGH, F.E.S.; Durban, Natal, September 27th, 1910.

ERRATA.—P. 75, line 1, for *brumata* read *boreata*; p. 75, line 8, for *back* read *bark*.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February* 1*st*, 1911.—Mr. G. T. Bethune-Baker, F.Z.S., in the chair.—It was announced that the Council had nominated the Rev. F. D. Morice, M.A., as President for the current year.—Mr. W. J. Kaye exhibited several *Heliconii* from Eastern Ecuador, including the forms *H. rubripicta*, *adonides*, and *feyeri* with streaked hind wings. He observed that it seemed now to be possible and even likely that *H. melpomene aglaope* would eventually be proved to be linked with *H. plesseni* through these newly discovered forms, and that this species would then have to be sunk as a subspecies of *H. melpomene*. Similarly, *H. notabilis* through *ilia* and *feyeri* was probably only a subspecies of *H. erato*, though the material was insufficient at present to form a conclusion.—Dr. Nicholson exhibited a new species of *Tachyporus* which he has named *fasciatus*. There were two specimens taken at Wicken Fen from under sedge refuse, the one in April, the other in August, 1910. This species is intermediate between *T. solutus*, Er., and *T. chrysomelinus*, L. It differs from the former in the shape of the antennæ, which are of the same length, but are not thickened towards the apex; by its finer puncturation throughout; by the pronounced broad black band on the elytra; and by the fact that the marginal bristles of the elytra are long and stout, as in *T. chrysomelinus*, and not short and fine, as in *T. solutus*.—Mr. H. J. Turner exhibited several very interesting forms of *Luperina guenéei*, including two new aberrations:—(i) ab. *murrayi* (n. ab.), which is quite typical *L. guenéei* in texture, shade of colour, and in markings, with this very marked difference, that the submarginal area between the dark marginal lunules and the submarginal line is much paler than any other portion of the wing, throwing out by contrast these dark lunules very conspicuously; (ii) ab. *fusca* (n. ab.), of which the three specimens exhibited are undoubted *L. guenéei* in all their characters but depth of colour. These are believed to be the first melanic specimens which have been so far obtained. All the markings are much intensified, the ground colour is much darker than in typical examples, very dark grey with, in a good light, faint flushes of a ferruginous tint. The contrast between ground colour and markings is very much stronger than in any of the other forms.—Mr. Champion exhibited on behalf of Mr. J. H. Keys the black variety of *Athous* *hæmorrhoidalis*, F., from Dartmoor, recorded by the latter in the Ent. Mo. Mag., xlvi., p. 262; and also a red variety of the male of *Agabus bipustulatus*, L., from the same locality.—The Rev. A. T. Stiff, who was present as a visitor, exhibited some second-brood specimens of *Polygonia c-album* var. *hutchinsoni*. The vars. including three intermediates, emerged on October 16th, 19th (3), 20th, 21st (2), 22nd, 23rd and 26th, 1910. It is believed that there is no record of var. *hutchinsoni* having ever been bred in the *2nd brood* of *c-album*.—Mr. Newman writes: "I have bred thousands of *c-album* of the second-brood in various years, and never one *hutchinsoni*, and I have never heard of any one else doing so."—Mr. Rowland-Brown and Mr. Bethune-Baker both observed that they had taken hybernated specimens of this form on the Continent.—Dr. O. M. Reuter communicated a paper entitled "Bryocorina nonnulla Æthiopica descripta ab O. M. Reuter et B. Poppius."—Commander Walker, one of the Secretaries, read a paper on behalf of Col. Manders, entitled "A factor in the production of mutual resemblance in allied species of butterflies." The methods adopted in his experiments, and the conclusions drawn from them by the author, were to some extent the subject of criticism both by Mr. G. A. K. Marshall and Dr. Chapman. —Mr. Merrifield added a few observations with regard to the comparative immunity of Pierine butterflies from the attacks of birds.—A vote of condolence with the family of the late Mr. J. W. Tutt was moved from the chair, all the Fellows present signifying approval by rising.—George Wheeler, *Hon. Sec.*

The South London Entomological and Natural History Society.—*January 12th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The President referred to the great loss that the science of entomology had incurred by the death of Mr. J. W. Tutt, a past President of the Society.—Mr. Phillips, of Forest Gate, was elected a member.—Mr. Tonge exhibited photographs of the ova in sitû of *Plebeius argus* (*ægon*), *Ruralis betulæ*, and *Calamia lutosa*, and also of the early stage of a wasp's nest (*Vespa sylvestris*) found in a pig-sty.—Mr. Lucas, a teratological example of *Anosia plexippus* with right fore wing shorter and narrower than normally and with concave outer margin.—Mr. Newman, (1) extremely light and very dark forms, with unusually small and very large forms, of *Malacosoma castrensis* and *M. neustria*; (2) a very red *Phlogophora meticulosa*; (3) second brood specimens of *Pericallia syringaria*, small and dark banded; (4) second brood of *Selenia lunaria*, i.e. var. *delunaria*; and (5) living imagines, pupæ and full-fed larvæ of *Aphantopus hyperanthus* reared by Mr. Oliver.—Mr. Adkin, selections of several broods reared originally from a black female ab. *nigra* of *Boarmia gemmaria*, and communicated a full note on the results.—Mrs. Hemming, bred and caught series of *Melitæa aurinia* from Wiltshire, where the species has been somewhat common.—Mr. Hemming, on behalf of Mr. P. A. Buxton, the same species with the note that all emerged in the afternoon; he also showed series of *Adopæa flava* from Sussex, showing two distinct forms.—Mr. Coote, two very dark green examples of *Panolis piniperda*.—Mr. Platt-Barrett, an example of *Saturnia pavonia-major* from Sicily.—Mr. Kaye, *Myelobius murana*, a sphingid-like *Pyrale* from South America.—Mr. Step, specimens and a series of photographs of the growth and development of the *Myxogaster*, *Brefeldia maxima* found by him at Horsley, and a cluster of oak galls *Cynips kollari* from which birds had systematically extracted the tenant larvæ.—Dr. Hodgson, long series of varied forms of *M. aurinia* of many localities.—Mr. West called attention to the drawer of the Society's type collection which he was exhibiting, and to which, while rearranging, he had added some sixty species of Coleoptera from his own collection.—Mr. Priske showed a number of slides illustrative of the life-history of the glow-worm, which Mr. Main and he were observing, and read notes on what they had done so far.—Mr. Lucas read a paper: "Notes on the Natural Order Neuroptera," and showed a large number of lantern slides to illustrate his remarks.—Hy. J. Turner, *Hon. Rep. Secretary*.

Lancashire and Cheshire Entomological Society.—Annual Meeting held at the Royal Institution, Colquit Street, Liverpool, December 19th, 1910, Mr. R. Newstead, M.Sc., F.E.S., Vice-President, in the chair.—The Reports of the Council and Hon. Treasurer were read and adopted, and the following members were elected as officers and Council for the ensuing year, *viz.*—President, S. J. Capper, F.E.S.; Vice-Presidents, W. J. Lucas, B.A.; C. E. Stott; Claude Morley, F.Z.S.; P. F. Tinne, M.A., M.B.; Geo. Arnold, M.Sc.; Treasurer, Dr. J. Cotton; Secretaries, H. R. Sweeting and Wm. Mansbridge; Librarian, F. N. Pierce; Council, E. J. B. Sopp, F.R.Met.S.; Wm. Webster, M.R.S.A.I.; Wm. Mallinson; W. T. Mellows; L. H. Lister; G. M. Taylor, M.A.; C. B. Williams; R. T. Cassal, M.R.C.S., L.S.A.; O. Whittaker; R. Wilding; and L. West, M.I.M.E. — Mr. Robert Newstead, the retiring Vice-President, delivered the Address, which was entitled "The Taxonomic Value of the Genital Armature in the Tsetse Flies (Genus *Glossina*)." He stated that he had made a careful examination of all the hitherto described species of the genus *Glossina*, which had not only revealed some very striking morphological characters, but had led to the discovery of three hitherto undescribed species, *Glossina submorsitans*, Newst., *G. brevipalpis*, Newst., and *G. fuscipes*, Newst., and also to the re-establishment of Bigot's *G. grossa*. The scheme of classification adopted was based entirely upon the taxonomic characters of the male armature, which are the true and almost only natural anatomic elements that can at present be found in these insects. He had found that the species fell into three very striking and distinct groups, each being separated by very trenchant characters. These are, Group I. (the *fusca* group).—This division includes the four largest species of the genus: *G. fusca*, Walker; *G. grossa*, Bigot, which have a Western distribution; *G. longipennis*, Corti; and *G. brevipalpis*, Newst., occurring chiefly on the eastern side of the continent (Africa). In all of these species the claspers are quite free, there being no membrane stretching between them; the distal extremities of these appendages have either a single large and bluntly pointed tooth-like extension, or they are bluntly bidentate; the harpes in all cases being markedly different in their morphological characters. Group II. (the *palpalis* group).—To this division belong the following species:—*G. palpalis*, Rob. Desv.; *G. tachinoides*, Westwood; *G. fuscipes*, Newst.; and *G. pallicera*, Bigot. In all of these species the claspers of the males are connected by a thin and finely spinose membrane, which is deeply divided medially, but in all cases the distal extremities of the claspers are quite free and widely separated. Group III. (the *morsitans* group).—This group comprises: *G. morsitans*, Westwood; *G. submorsitans*, Newst.; and *G. longipalpis*, Wiedemann. In these the claspers are completely united by a spinose membrane, and they are also fused medially. They are of very remarkable form, their shape somewhat resembling the scapula of a mammal in miniature, and are altogether much more highly complicated structures than those in either of the preceding groups. Thus we see in these three groups forms which are so widely different as to lead one to assume, without taking other external features into consideration, that they represent three distinct genera. Certain it is that these insects illustrate one fundamental principle of evolution, namely, that they have attained great development of one set of morphological characters and have retained others apparently of an ancestral type.

January 16*th*, 1911.—Mr. Geo. Arnold, M.Sc., Vice-President, in the chair.—A discussion on "*Agrotis cursoria* and its Varieties" was opened by Mr. Wm. Mansbridge, and continued by Mr. T. Baxter, of St. Anne's-on-Sea, Mr. F. N. Pierce, and other members.—Mr. Baxter brought his fine varied series of *cursoria* for exhibition, which included some very rare forms, as well as the commoner vars. *brunnea*, *ochrea*, *saggitta*, *cærulea*, *costa-cærulea*, and *obsoleta*. Mr. W. Mansbridge also brought a varied series from St. Anne's. At Wallasey and Crosby *cursoria* is of extremely rare occurrence and, though still common on the North Lancashire sandhills, it is not nearly so abundant as was the case some twenty years ago, owing to the encroachments made by builders and golfers upon its haunts. Mr. Baxter said that, having given particular attention to the matter, he had never seen the ordinary mottled form *in coitu* with the streaked form *saggitta*; he suggested that there might be two species in collections under the same name; he had seen many pairs in copulation during the last season, but they were always of similar varieties. Other exhibits were by Mr. C. B. Williams: *Hesperia lineola*, *Apamea ophiogramma*, and *Plusia moneta*, from Cambridge; a series of *Macrogaster castaneæ* and a large number of local fen species from Wicken.—Mr. Geo. Arnold brought *Pepsis formosus*, from California, locally called the "Tarantula Killer," together with our largest British Pompilid, *Salius fuscus*, for comparison; *Amomma burmeister*, male and female—the "Driver Ant"—from Central Africa.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Vol. x. By Sir George F. Hampson, Bart. London: Printed by Order of the Trustees. 1910.

In this volume of eight hundred and thirty pages the Erastrianæ, a subfamily of the Noctuidæ, are catalogued and described. Of the twelve hundred and twenty-two species comprised in the subfamily over one-fourth are novelties, whilst very nearly half of the one hundred and thirty-six genera to which the species are referred are new.

More than half of the Erastrianæ are included in the following six genera:—*Eublemma*, Hübn. (t. *suava*, Hübn.), 230 species; *Ozarba*, Walk. (t. *punctigera*, Walk.), 107 species; *Tarache*, Hübn. (t. *caffraria*, Cram.), 102 species; *Lithacodia*, Hübn. (t. *bellicula*, Hübn.), 86 species; *Eustrotia*, Hübn. (t. *uncula*, Clerck), 73 species; *Corgatha*, Walk. (t. *zonalis*, Walk.), 53 species.

On the other hand, upwards of sixty genera have each only one species, and seventeen other genera have but two species assigned to each of them.

The British species of Erastrianæ are:—5147. *Eublemma* (*Thalpochares*) *ostrina*, Hübn. 5181. *Eublemma* (*Thalpochares*) *parva*, Hübn. 5185. *Eublemma noctualis*, Hübn. (*Thalpochares*) *parva*, Hübn. 5807. *Lithacodia* (*Erastria*) *fasciana*, L. 5859. *Eustrotia* (*Hydrelia*) *uncula*, Clerck. 5862. *Eustrotia olivana*, Schiff. (*Bankia argentula*, Hübn.). 6000. *Erastria* (*Agrophila*) *trabealis*, Scop. 6185. *Tarache* (*Acontia*) *lucida*, Hüfn. (*solaris*, Schiff., *albicollis*, Fab.). Numbers show position in arrangement.

The present volume is the seventh of the series treating of the Noctuidæ. Of this extensive family of moths considerably over six thousand species have, so far, been dealt with. Not only are the species fully described, and the distribution, as indicated by specimens in the National Collection, set out, but all the new species, and also those not previously illustrated, are figured. The previous Noctuid volumes are—iv. Agrotinæ (1903); v. Hadeninæ (1905); vi. Cucullianæ (1906); vii.–ix. Acronyctinæ (1908–10).

It may be mentioned that the Atlas of Plates belonging to vol. x. will not be ready for a few months.

Annual Report of the New Jersey State Museum. Including a Report of the Insects of New Jersey. Pp. 880. Trenton, N. J. MacCrellish & Quigley. 1910.

This is a revised and extended edition of an exceedingly useful list. It comprises references to 10,385 species, as against 8537 in the second edition (1900), known to occur in the State of New Jersey. Besides numerous illustrations in the text, there is a map, in colour, and three portraits—Head of the Biological Department, State Entomologist, and State Taxidermist.

A Book of Nimble Beasts. By Douglas English. Pp. 319. London: Eveleigh Nash. 1910.

For boys and girls who wish to know something about the appearance and habits of some of our smaller mammals and common insects, this attractive little book should be an acceptable gift. The illustrations, over two hundred in number, are from photographs taken by the author. There are four coloured plates.

OBITUARY.

We regret to announce the death of Gerald George Hodgson, who was born in Brighton on October 10th, 1860, and was educated at the College there, and at King's College, London. House Physician at King's College Hospital; House Surgeon at the Brighton and Hove Dispensary; and afterwards House Physician and House Surgeon at the Sussex County Hospital. Succeeding his father, he was in private practice for eight years in Brighton, and for the last eight years had been attached to the Royal Eye Hospital, Southwark.

A very busy and strenuous life left him but few opportunities of pursuing his favourite studies of botany and entomology, the latter for many years being most intermittent, but this dearth of opportunities caused him to note more particularly the habits of the creatures he met with, and he studied closely those little things that incline to the paucity or abundance of insect life, so frequently neglected by the mere collector. In 1898 his health broke down, after a severe illness brought on by overwork and a bicycle accident, and upon his partial recovery he was peremptorily ordered to give up his profession and go for a long sea voyage. This culminated in his settling for a time in Queensland, where he took up some land and regained health in its culture. As opportunity served, he again used his net and obtained many rare and interesting butterflies whilst in the colony.

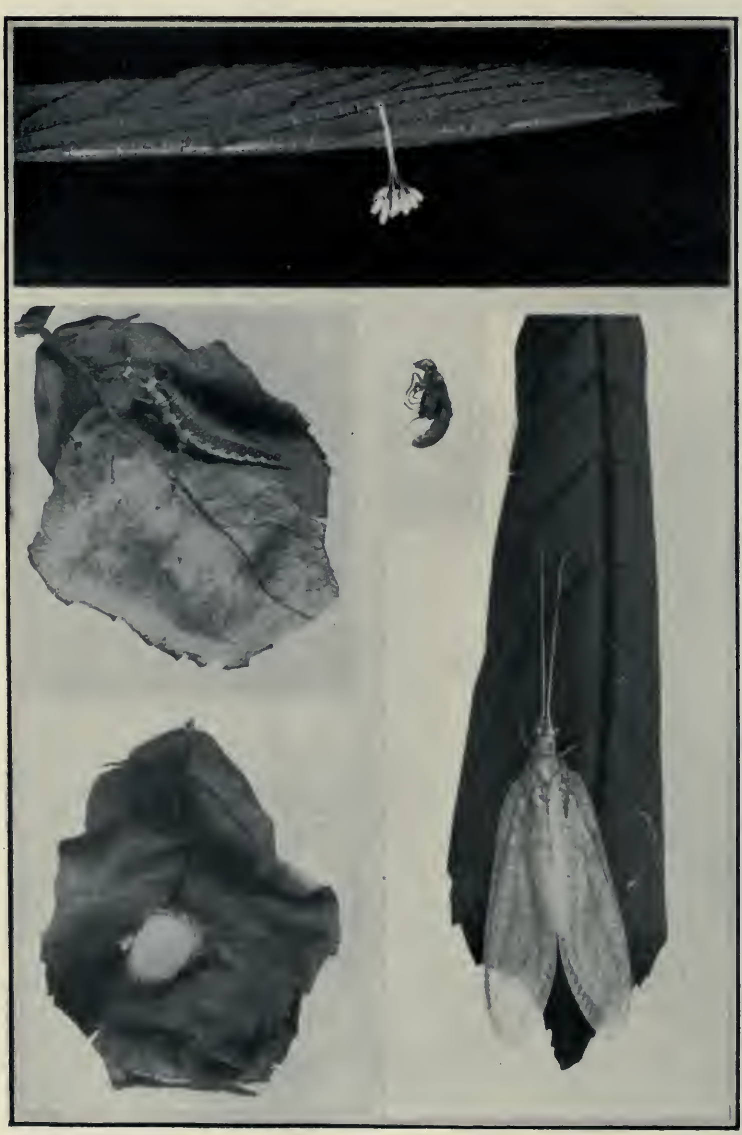
Upon his return home, he took up his last medical appointment, and in his spare time arranged his cabinet of Lycænidæ upon a plan of his own, namely, to exhibit at a glance over the drawer similar aberrations and varietal forms of each species. Thus the columns represented the species, and the cross-files the aberrations, either common to all or only to a few of the butterflies, placed together as a group.

Hodgson was a very hard worker in the field, and the toil he willingly underwent would deter many men, but with it all he was very successful, and his "luck" in obtaining varieties almost phenomenal. He was not a prolific writer, but his lectures and papers show much original work; as witness an address given to the City of London Society, 1909, opening an intended discussion upon the relative "Importance to the Rhopalocera of the upper or under sides of the wings." In this he dealt with the subject in such detail that he really covered the whole ground and left nothing debatable to be entered upon. He was also a keen botanist, and probably knew more of the life-histories of our British Orchids in the unflowering stages than any living man.

Dr. Hodgson's death was entirely unexpected. He left London, and was about to go to Devonshire for a short rest, but was found to have passed away in his sleep on Friday the 3rd ult.

In private life he was geniality personified, and much beloved by the young, entering into their sports and games with enthusiasm; whilst best of all, perhaps, was his rule of life, "If possible, let no day pass without doing some one an act of kindness." This shows what the real man was more than any adulatory epitaph.

S. W.



Hugh Main photo. West, Newman proc.

CHRYSOPA FLAVA, Scopoli.

1, Ova. 2, Larva. 3, Cocoon. 4, Nymph. 5, Imago. All × 2.

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ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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The arrangement of the Coleoptera in the last edition of Reitter's 'Catalogue' of the European species is one which appeared to be quite new and strange to many of our students of the British fauna.

That arrangement seems, however, to have been based very largely upon the classification of the Coleoptera proposed by Ganglbauer in 1903, which itself is only one of three or four different classifications published since the appearance of Sharp's in the second volume on 'Insects' in the Cambridge Natural History.

The classification proposed by Dr. Sharp, in which the families of Coleoptera are grouped together in six series, beginning with one highly specialized group, the Lamellicornia, and ending with another as highly, or perhaps even more highly, specialized group, the Rhynchophora, was evidently not framed to accord with any particular views in regard to the phylogeny of the groups.

In this respect it differs from those more recent classifications, in which the aim has been to arrive at correct views as to the origin and different lines of descent of the various groups and families, and to give expression to those views in the classification.

As these attempts to classify the beetles in accordance with their phylogeny seem to be still not very generally known to British students, it is proposed here to give some account of them.

No serious attempt to establish a general classification of the Coleoptera, based upon phylogeny, seems to have been made until Professor Lameere undertook the task, whose first results were published in his "Notes pour la Classification des Coléoptères."* This paper, which received notice in the 'Entomologist' at the time, is remarkable, not so much for the novelty of the classification proposed as for the many valuable hints and suggestions it contained, and the great stimulus it appears to have given to others to work in the same field. Notwithstanding some serious mistakes which have since been very readily admitted by the author himself, Lameere's classification was a great step in the right direction. Previous to its publication, Ganglbauer had recognized that three different types of wing-venation are to be met with in the Coleoptera: one characteristic of the family-series Caraboidea; another of a series of families that used to be included in the heterogeneous assemblage known as the Clavicornia, but which he for the first time had withdrawn to form into a distinct group or family-series, the Staphylinoidea; and a third type, occurring under various modifications in the different families that did not come into either of those two family-series.

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* Ann. Soc. Ent. Belg. xliv. p. 355 (1900).

Accepting this threefold type of wing-venation as a basis for classification, Lameere divided the Coleoptera into three sub-orders: the Cantharidiformes, the Staphyliniformes, and the Carabiformes, the two latter corresponding almost wholly with the family-series Staphylinoidea and Caraboidea of Ganglbauer, but with a fresh arrangement of the families in each group. The Cantharidiformes he subdivided into ten groups, which from considerations of structure and phylogeny he placed in the following order: Teredilia, Malacodermata, Sternoxia, Macrodactyla, Brachymera, Palpicornia, Clavicornia, Phytophaga (with which he includes the Longicornia and Rhynchophora, the Brenthidæ excepted, which he places among the Clavicornia), Heteromera, and Lamellicornia. He pointed out the absurdity of Leconte and Horn's view that the Rhynchophora were distinct from all other Coleoptera, and the lowest and most ancestral of all; that, on the contrary, this group was very highly specialized, and so little distinct from the Phytophaga that they may reasonably be supposed to be derived directly from them and ought to be included in the same group.

At this time he believed that the Teredilia (in which group were included the families Lymexylonidæ, Anobiidæ, Bostrichidæ, Cupedidæ, and Derodontidæ) contained the forms most nearly approaching to the ancestral type of beetle; and he therefore placed the Cantharidiformes as the first of his three suborders. It was a mistake, as he has since recognized, not to place the Carabiformes first; and for this his first proposed classification, of which we have given here the bare outlines, he has in a later paper * substituted another.

In the meantime there had been two other very notable contributions to the morphology and classification of the Coleoptera, one from Professor Kolbe,† of Berlin, and the other from Herr

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* "Nouvelles Notes pour la Classification des Coléoptères," in Ann. Soc. Ent. Belg. xlvii. p. 155 (1903).

† "Vergleichend-morphologische Untersuchungen an Koleopteren nebst Grundlachen zu einen System und zur Systematik derselben," in Archiv. für Naturg. 1901, Beiheft. p. 89.

Ganglbauer,* of Vienna. Each of these distinguished systematists has given us a classification of his own, based on views in regard to the phylogeny and relationship of the different groups and families. Ganglbauer, whose paper came last, was enabled to give a full account, accompanied by rather searching criticism, of the classifications of his two predecessors.

Professor Kolbe has since modified his views to some extent, as shown in a subsequent publication,† wherein he has revised his classification and entered more largely into the arguments in its favour.

The three classifications, that of Ganglbauer and the later ones of Lameere and Kolbe, differ from each other in certain important respects, which is not strange considering the great difficulties the subject presents; but they have also some very important points of agreement, and this may be considered a great gain to the systematics of the Coleoptera.

The differences are due largely to the relative value assigned by each to the principal characters taken into consideration; and as some of these characters had not been used before to any great extent in the classification of the Coleoptera, it may be well, first, to point out what they are, and to call attention to the different interpretations that have been or may be placed upon them.

Wing-venation.—Although it was not until quite recently that the wing-venation has been made to play any considerable part in the classification of the beetles, its study had not altogether been neglected. Burmeister, for example, had shown that the families Carabidæ, Paussidæ, Dytiscidæ, and Gyrinidæ, possessed in common a characteristic type of wing-venation differing from that of other beetles, and on this ground had placed them together in the group Adephaga. Otto Roger, as the result of his study of the wing-venation from a phylogenetic point of view, came to the conclusion that the Malacoderms represented an ancient type from which all other beetles, except the Adephaga, might be derived. The Adephaga he considered to be a very ancient type, which had already branched off from the common stem before the Malacoderms had arrived at a stage represented by any existing forms. So that here was already suggested a division of the Coleoptera into two main groups: the Adephaga on the one side, and the Malacoderms and their derivatives on the other. As will be seen later on, a division of the Coleoptera into two suborders, the Adephaga and the Polyphaga, seems to be well justified on other grounds.

In addition to the type characteristic of the Adephaga, two other types of wing-venation are, according to Ganglbauer, to be met with in the Coleoptera.

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* "Systematisch-Koleopterologische Studien," in Münch. Kol. Zeit. i. p. 271 (1903).

† "Mein System der Coleopteren," in Zeitschrift für wissensch. Insektenbiol. (1908).

Adopting the views and the nomenclature of Comstock and Needham, he designates the chief longitudinal veins in the wing as follow:—Costa, subcosta, radius, media, cubitus, and analis. The first three run close together from the base along or quite near to the front margin of the wing. The media runs more diagonally from the base, dividing the wing into two considerable areas, which vary somewhat in their relative proportions. In the anterior area, between the media and the radius, two other longitudinal veins, one considered to be a branch (M_1) of the media and the other (R_2) a branch of the radius, may generally be recognized. In the posterior area lie the cubitus and analis and their branches.

What appears to be the most primitive condition of the wing-venation in beetles occurs in the small family Cupedidæ (Fig 1).

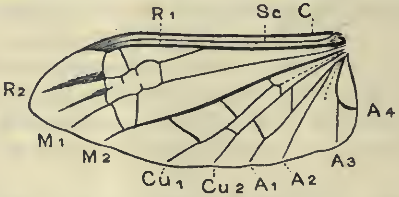

Fig. 1.—Wing of *Omma stanleyi*, Newm. (Cupedidæ.) (After Kolbe.)

Here all these veins remain in a more or less completely developed and unmodified state, and are joined together by a greater number of transverse veins than are known to occur elsewhere in the Coleoptera. The anterior branch (M_1) of the media (M_2) is a long vein running uninterruptedly almost from the base to the margin, and is joined by means of two transverse veins with the media, and by two with the posterior branch (R_2) of the radius, which itself is joined to the radius by two transverse veins. There are to be seen also two transverse veins between the cubitus and media, and two between the cubitus and analis.

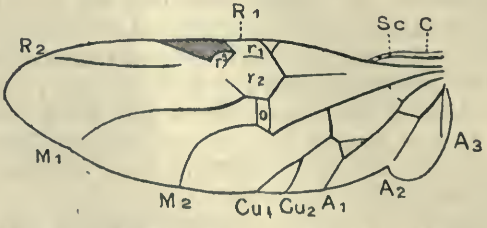

Fig. 2.—Wing of *Tachypus flavipes*, L. (Carabidæ.) (After Kempers.)

In other beetles some or all of the transverse veins have disappeared, and the anterior branch (M_2) of the media has also in some part of its length disappeared.

It is characteristic of the Adephagan wing that this branch (M_2) is joined to the media by means of one or two, generally by two, transverse veins. When two are present, an oblong cell is formed, which affords a ready means of recognizing the type.

The Adephaga generally show a modification of the simpler and more primitive type, as met with in the Cupedidæ. The anterior branch (M_2) of the media has in part disappeared, especially in the proximal area of the wing, and the media itself shows a peculiar twist or bend in its course near the point where the transverse veins join on to it (Fig. 2).

The chief characteristic of the Staphylinoidean type of wing-venation—the second of Ganglbauer's types—lies in the disappearance of all the transverse veins, and of the proximal part of the anterior branch (M_1) of the media, the distal part only of this branch being left as an isolated vein in the apical area of the wing (Fig. 3).

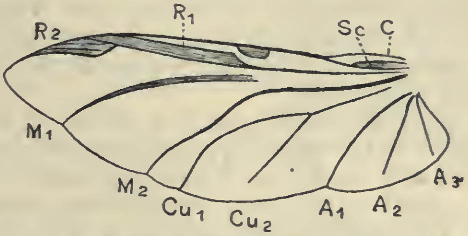

Fig. 3.—Wing of *Necrophorus vespilloides*, Herbst. (After Kempers.)

The third type of wing-venation*—the Cantharoidean type—is characterized by the curved, hook-like connection which the anterior branch (M_1) of the media makes with the media, so that it looks like a recurrent branch of the latter. In a similar manner the posterior branch (R_2) of the radius appears as a recurrent branch of that vein. The distal parts of these branches frequently appear in the apical area of the wing as radiating veins, but are sometimes altogether absent (Fig. 4).

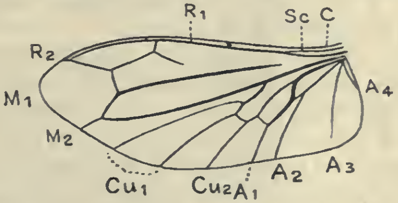

Fig. 4.—Wing of *Lampyris noctiluca*, L.

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* Ganglbauer figured the wing of *Lygistopterus sanguineus* to illustrate this type. This wing wants one of the two tranverse veins between A_1 and Cu^2; and I have substituted for it the wing of *Lampyris*, and lettered the veins in accordance with my own views.

(To be continued.)

NOTES ON THE LIFE-HISTORY OF *CHRYSOPA FLAVA*, SCOPOLI.

By E. Maude Alderson, F.E.S.

(Plate IV.)

This species is one of our most frequently noticed British Chrysopids. This is in part due to its being a fairly common insect, and in part to its size, it being one of the largest—if not the largest—representative of the family in this country. I have one female which measures 46 mm. in expanse; and though this is the largest individual specimen I have met with, I have others which measure from 35–37 mm.

McLachlan, in his "Monograph on the British Neuroptera Planipennia" (Trans. Ent. Soc. 1868, part ii.), says: "*C. flava* especially frequents trees bordering streams." This is certainly true, but I do not think there is any connection between this species and water, and it is certainly quite as frequently found in gardens and woodlands.

The only other British species with which *C. flava* is likely to be confounded is *C. vittata*, Wesmael, and McLachlan has a note that these two have been constantly mixed in collections. They are of about equal size, but *C. flava* can at once be separated by the excised costal margin of the anterior wings. This character, which is constant, can be plainly seen in Mr. Main's photograph. The fore wings seem to rise somewhat abruptly from the thorax, and then at about one-third the costa gives a distinct "dip." *C. vittata* has a much more rounded costa, and the wings are more "ample" looking. Another good point of difference is the length of the second antennal joint in *vittata*, which is almost twice as long as in *C. flava*. *C. flava*, also, is of a richer shade of green, and possesses a broad yellow longitudinal line down the whole length of the thorax and abdomen. *C. vittata* is also lighter on the thorax, but is more wholly and uniformly pale greenish in colour.

All my specimens of *C. flava* I find on examination have been taken during the months of May and June. It must occur throughout the summer, however, as I have notes of ova found during July and August, and Mr. Main writes me that the example photographed was taken so late as August 20th. The very large female mentioned above was caught fluttering among the leaves of a climbing rose, and was evidently searching for aphides, near which to deposit her eggs. She laid thirty-nine ova on July 14th, which hatched out on the 20th of the same month. The ova have their footstalks united into a bundle, as shown in Mr. Main's photograph. Two other groups of ova which I possessed contained sixteen and nine ova respectively. The group of sixteen was found on August 14th of last year, and were evidently just laid. They hatched on the 21st, which (taken in conjunction with my former experience) seems to fix the period between oviposition and emergence at about a week. The ova are of a lovely shade of soft pearly green when deposited. Two days later they begin to change colour, becoming yellowish at the ends. They then gradually become paler in tint, until the day before hatching, when they appear wholly white, with two conspicuous brown spots at the apex—the eyes of the embryo.

The larvæ, when newly hatched, are about 2 mm. in length, of a shining transparent white, with a pearly lustre. Two rose-coloured lines run down the thorax, and continue down the abdomen. By the second day the head markings appear. They consist of two straight lines, slightly converging towards the neck; the thoracic lines continue these markings down the body. The eyes are jet-black and very conspicuous; two slight stripes run through them, along the sides of the head. The tibiæ are ringed with faint fuscous. These markings, though becoming more complicated with age, comprise the characteristic features in the general appearance of the larva in all stages. Some of them can be distinctly noted in the photograph.

The following is a description of the full-grown larva, taken from my notes made at the time:—

Length 12–13 mm. *Colour* pale straw-colour with reddish madder markings. The central area lighter, with a dark stripe running down the whole length of the back to the tail. The mottled markings on the back deepen at the sides, causing the appearance of darker side-stripes; but beyond this there is always a light line of pale straw-colour. *Sucking-spears* madder. *Antennæ* lighter in shade. *Eyes* black, with a dark line at the side of the head running up to the eye. *Head* transparent whitish. *Characteristic head markings:* two straight lines branching outwards, madder-fuscous, deepening at the ends nearest the thorax. *Prothorax* with two vertical dashes and a central spot, black. *Meso-* and *metathorax* each with two black dots. *Legs* straw-colour; *tarsi* dark ringed. *Underneath parts* wholly straw-coloured. In general appearance the larva is much less hairy than other species of Chrysopidæ that I have met with. It is also more cylindrical in shape (not so flat-looking). It is an extremely active larva, running about vigorously as soon as hatched, and hunts its prey, or hides itself amongst the leaves, with great rapidity. It is very cannibalistic, attacking its neighbours savagely if hungry. On each occasion, when I have bred it from the egg, I have lost more than half the batch through not removing the young larvæ as soon as hatched. The apices of the ova lying close together (owing to their being laid in groups), the young larvæ can conveniently rest on their own egg-shells and attack all the unhatched ova within reach. As they are extremely voracious from birth, this may result in all being lost, except those that are lucky enough to hatch simultaneously. This happened with the first batch I possessed, numbering thirty-nine ova, from which I only secured some eight or nine larvæ. I have a note at the time that the larvæ remained motionless on their egg-shells for some considerable time, and that I could not discover what they were doing. That is some five or six years ago. I know now, having had an exactly similar experience only last season, and shall always take care in future to remove the young larvæ immediately they emerge. They are not so liable to attack one another later, unless short of food; or unless one individual deliberately gets in another's way; but they will do so at all stages of growth, even when the victim is spinning.

I could not discover more than two changes of skin in my larvæ, and from the observations I have made with other species this seems to be the normal number, though it seems difficult to understand how full growth can be attained without more. The following table gives the dates of four individual larvæ:—

	Hatched.	1st Change.	2nd Change.	Spun up.
1.	Aug. 14th	Aug. 19th	Aug. 23rd	Sept. 3rd.
2.	Aug. 14th	Aug. 19th	Aug. 23rd	Sept. 4th.
3.	Aug. 21st	Aug. 27th	Sept. 2nd	Sept. 14th.
4.	Aug. 21st	Aug. 27th	Sept. 2nd	Sept. 16th.

I have never yet discovered *Chrysopa* ova earlier than midsummer, so I cannot say for certain whether the "lacewings" are double-brooded or not. My impression, however, is that they are *not*. I have kept imagines alive for a month in confinement, which seems to prove that the imaginal existence is longer than has been supposed, and few species emerge before the end of May or beginning of June in any quantity, so that it seems improbable that two broods can occur in the year. I can, however, only speak with certainty with regard to those I have bred, and in no case has the imago emerged until the following spring or summer. Emergence is not complete on the insect escaping from the cocoon, the imago being covered with a transparent pellicle, from which it frees itself by slitting the thorax. In this stage (which in a healthy example is *very* short) the wings are only 3 mm. in length, the fore wing appearing slightly shorter than the hind wing and resting above it. The eyes are of the same bright green as in the perfect insect. The antennæ are quite short, and folded round the eyes like a ram's horn. They appear to lengthen rapidly, and when fully extended are curled underneath the body. The wings show their iridescence through the pellicle, and the bright yellow line on the thorax is as distinct as in the full emergence. It is not often one gets a chance of observing this period of the insect's existence, but in the case of the example from which my description is taken the imago was unable through weakness to cast its pupal covering, and remained for two or three days in a helpless condition. Emergence (in the case of those I bred) generally took place in the morning.

Mr. Main's experience was that, early in the season, a large percentage of emergences took place in the evening, between five and six p.m. Later in the year he observed many freshly emerged imagines, in the same spot, about eight in the morning, as he went to the station; whilst on the return journey, in the afternoon, emergences were still going on. Mr. Main was fortunate enough to be able to make these observations in a place where *C. flava* was common; and his notes have the advantage over mine that they were taken from the insects in a state of nature, whereas my imagines were reared artificially. It may, perhaps, be safe to assume that emergences take place throughout the day, in the absence of further evidence, but more observation is needed on this and many other points.

I was never fortunate enough to see either the emergence of the nymph from the cocoon, or the escape of the imago from its pupal covering. Mr. Main's impression is that the nymph, on emerging from the larval skin, cuts an opening in the cocoon, with jaws specialised for the purpose, and crawls out, the cocoon lid dropping back into its place behind it. He thinks the insect then gets a firm grip with its feet on some near object, and the imago at once escapes, from the splitting of the skin in the dorsal region. His experience coincides with mine in that, in the case of successful emergence, the whole process is a remarkably rapid one; whilst disturbance generally results in failure to cast the pupal covering and consequent death.

I am afraid these notes are very imperfect, but Mr. Main, who has kindly sent me larvæ from time to time, has asked for such observations as I can with confidence attach to this species. Some of the facts are also from notes taken some years ago, on a former occasion, when I bred *C. flava*. Other species are under observation, and I hope in time to be able to record the breeding of most of our familiar British members of the family. The larvæ are very easy to rear, and give little trouble. Moreover, their active existence is short, which makes them suitable subjects of observation for those who, like myself, have not much leisure. Further, I know of no published description of the larvæ, which makes their study more interesting; and with the help of such beautiful photographs as Mr. Main produces, the value of such notes can be much enhanced, the Chrysopids being difficult subjects for the pencil and brush.

Park House, Worksop, Notts: January 25th, 1911.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

By E. H. Strickland (Dip. S.E.A.C.).

New Species found in a small Collection of Mosquitoes from Western Australia.

This collection, which was made by Dr. Cleland, of the Department of Public Health, Perth, Western Australia, was sent to Mr. F. V. Theobald.

All the twenty-two specimens sent were found to belong to the sub-family Culicinæ, and at least seven of them represented species up to the present undescribed.

Some of the specimens arrived in too damaged a condition to be identified.

The new species, comprising three *Culicelsa* and one *Grabhamia*, are described in detail below, together with notes on their habits, &c., made by Dr. Cleland.

Type specimens of the species have been forwarded to the British Museum.

Culicelsa westralis, n. sp.

Thorax clothed with golden brown scales with three longitudinal lines of white scales. There is also a patch of white scales before the similarly clothed scutellum. Abdomen black with snowy white basal bands.

Legs with black tarsi which have conspicuous snowy white basal bands. Femora and tibiæ pale scaled ventrally.

♀. Head black with large creamy narrow curved scales round the median line and back of head, and smaller narrow curved scales at the sides and round the eyes. The lateral flat scales are for the greater part white, but there is a deep purple band at the sides of the head. The upright forked scales are black. Eyes, silvery. Antennæ with basal segment dark and bearing a few white flat scales and black hairs. Palpi with black and white mottled scales, which are mostly white at the apex. Proboscis not mottled.

Thorax brown with three narrow longitudinal black lines, clothed on the apical two-thirds with golden brown narrow curved scales, which become larger and whiter on the basal third. There are also three indistinct lines of white scales stretching along the black lines of the thorax from the white patch, the median of which almost reaches the head, whereas the lateral lines terminate a little beyond the centre of the thorax in two more or less distinct white spots. Scutellum clothed with white narrow curved scales. Prothoracic lobes with small white narrow curved scales and black bristles. Pleuræ with white flat scales. Abdomen black with well-defined white basal bands on all segments. A slight apical banding also is present on the two apical segments. Ventral surface with white scales except for a small dark central spot on each segment.

Legs with very distinct white basal bands, femora with a slight apical band also, they are mottled with black and white scales all over. Femora, tibiæ, and metatarsi mostly white scaled below. Tarsi deep black all over except for the white basal bands.

Wings rather densely scaled with black scales. First fork cell considerably longer and narrower than the second fork cell, its stem somewhat over half the length of the cell. Supernumerary and mid cross-veins in a line with each other, posterior cross-vein about its own length distant from the mid cross-vein. Halteres with light stems and dark knobs which bear small white scales.

Length 5-6·5 mm.

Hab. Western Australia.

Observations.—Described from three females.

Of two of the specimens identified as belonging to this species Dr. Cleland says:—"King's Park, Perth, and in closet, Perth . . . Vicious. Bites by day and all the year round." Specimen taken September 23th, 1906, and of the third, referring to the larvæ from which the specimen was hatched:—"Overflow from Port River, Adelaide, clear but still water. Salt, though perhaps not quite as salt as the sea. Enormous numbers of larvæ, especially in the shade. Most remained about four inches under water, occasionally coming up to surface. There seemed to be a stratum at this layer as various things floated there. Pupæ appeared January 29th, 1906; nymphs, January 31st, 1906."

The species is allied to *Culicelsa alboannulatus*, Macquart, but can be at once distinguished from it by the absence of a white ring near the apex of the femora.

Culicelsa uniformis, n. sp.

Thorax uniformly clothed with golden brown scales, except just before the scutellum where they are paler. Scutellum with creamy scales. Abdomen black with light ochreous basal bands. Tarsi black with snowy white basal bands.

♀. Head black with creamy narrow curved scales at the back, more golden brown in front. The upright forked scales are black. The flat scales are black and white in patches. Palpi dark scaled with a few white scales and hairs at the apex.

Thorax black with uniform golden brown narrow curved scales, except before the scutellum where they are of a lighter colour. Scutellum with creamy narrow curved scales. Prothoracic lobes with ochreous narrow curved scales, spindle-shaped scales and bristles. Pleuræ with ochreous and white scales. Abdomen basally banded with light ochreous scales. Apical segment mottled and apically banded, the basal band is absent. The next segment is both apically and basally banded. Ventral surface creamy scaled. Femora mottled, ochreous and dark, knee spot ochreous. Tibæ unbanded. Tarsi with sharply defined white basal bands. First and second legs with last two tarsi unbanded. Hind legs with all tarsi banded.

Wings not very densely scaled. First fork cell longer and narrower than the second posterior cell, its stem over half the length of the cell. Supernumerary cross-vein slightly nearer the base of the wing than the mid cross-vein. Hind cross-vein slightly more than its own length distant from the mid cross-vein. Halteres with ochreous stems and knobs, the latter bearing ochreous scales.

Length 4·5–5 mm.

Observations.—Described from two somewhat damaged females. It is closely related to *Culicelsa westralis*, n. sp., but the uniform thorax separates it from this species. It also comes near *Culicelsa togoi*, Theobald, but has ochreous banding on the abdomen, whereas the latter has snowy white bands.

Dr. Cleland's notes on this species are:—(1) "King's Park, Perth, and in closet, Perth. Vicious. Bites by day and all the year round." (2) "Port River swamps, Adelaide. Bites severely, raising weals even in strong sunlight in the open and with a moderate breeze."

The *dates of capture* were March 28th, 1907, and January 26th, 1906, respectively.

Culicelsa similis, n. sp.

Thorax uniformly clothed with golden brown scales, except just before the scutellum where they are paler. Scutellum with ochreous scales. Abdominal bands white laterally, and ochreous on median area. Tarsal bands snowy white.

♀. Head black with creamy narrow curved scales, black upright forked scales, and flat scales in black and white patches. Palpi rather long, black with white apical scales, and a few white scales at the juncture of the second and third segments. Proboscis long.

Thorax black, clothed with uniform golden brown scales, which become paler before the scutellum. Scutellum with ochreous narrow curved scales. Pleuræ and prothoracic lobes with ochreous scales. Abdomen basally banded, bands white laterally but ochreous on median area. Apical segments not mottled, and without apical banding. Femora not mottled, dark scaled above, pale scaled below on basal half. Knee spot ochreous. Tarsi with well-defined white bands on most joints. Fore legs with three apical tarsi unbanded. Mid legs with two apical tarsi unbanded, and hind legs with apical tarsus unbanded. First fork cell longer and distinctly narrower than the second posterior, its stem not over half the length of the cell. Hind cross-vein almost one and a half times its own length distant from the mid cross-vein. Halteres with almost white stems, knobs blackish with white scales.

Length 4·5–5 mm.

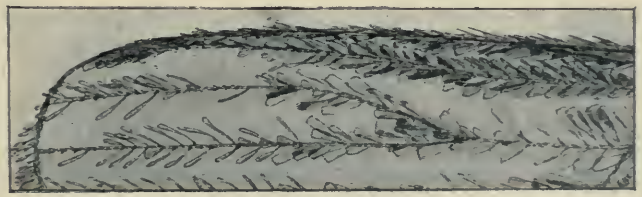
Observations.—Described from a single perfect female. This is evidently very closely related to *Culicelsa uniformis*, n. sp., but can easily be separated by possessing white lateral scales to the abdominal bands. The halteres also are quite distinctive.

"Mt. Lofty, South Australia, January 9th, 1906. Caught in day by disturbing bushes, &c., near stationary pool of water. Bite severely."

Grabhamia australis, n. sp.

This is a large, clumsily built species. Thorax densely clothed with rich brown scales. Scutellum with white scales. Abdomen dark scaled basally, lighter apically with indistinct narrow basal bands. Legs with tarsi unbanded. Wing scales mottled.

♀. Head densely scaled, and with a few long bristles. The curved scales are large and white in colour, except at the borders of the eyes where they are smaller and of a deep golden brown. The upright forked scales are numerous and all black. The flat scales at the sides of the head are mostly white, though a part of their area is covered with purplish dark scales. The eyes are mainly silvery but have large dark black irregular patches. Clypeus shiny black. Palpi densely clothed with dark scales, and a few outstanding bristles. Proboscis covered with mixed dark and white scales, giving it a mottled appearance. The basal joint of the antennæ is clothed with small dark hair-like bristles and a few small narrow flat white scales. Mesonotum dark brown thickly clothed with deep golden brown narrow curved scales, which are larger and of a white colour just before the scutellum. Three rows of bristles are also present, the central one of which is somewhat irregular. Scutellum with large white narrow curved scales and a few long bristles on the lateral lobes. Prothoracic lobes with white curved and hair-like scales. Pleuræ plentifully covered with white flat scales. Abdomen mainly covered with dark flat scales of a violaceous reflection, which become lighter in colour on the apical segments. First segment with a few whitish scattered scales. Small white lateral apical spots on the second segment, and a pale indistinct apical band consisting of a single row of scales is first noticed on the third segment. It becomes more pronounced on the succeeding segments, except on apical where it becomes merged into the general pale coloured scales covering the whole segment. The lateral spots also become more distinct on the third and succeeding segments. The ventral surface of the abdomen is almost entirely covered with white scales.



Portion of wing of *Grabhamia australis*, n. sp.

Wings large, longer than the abdomen; veins, except at the apex where the scales are culex-like, clothed with mixed dark and white Tæniorhynchus-like scales. The dark scales which are brown in colour with a purplish reflection are the most numerous. The first submarginal cell is slightly narrower though somewhat longer than the second posterior cell, its stem is not half the length of the cell. Posterior cross-vein about its own length from the mid cross-vein.

Legs with femora, tibiæ, and metatarsi mottled with brown and white scales. The apices of all the femora are white. White incomplete basal bands are just visible on one or two of the tarsal joints, particularly the second posterior tarsi, but appear to be absent as a general rule.

Length 7·5 mm.

Observations.—Described from a single female. It is a very marked, large, rather clumsily built species.

Locality and *date of capture.*—"Serpentine, Darling Range, near Perth, W. A., October 21st, 1906."

Note.—This species is placed in *Grabhamia* on squamous characters only, though it appears to be a much larger and more solidly built species than any so far described in that genus. As only one specimen was received, structural characters by dissection could not be made out.

(To be continued.)

NEMOURA DUBITANS, MORTON, A SPECIES OF PLECOPTERA NEW TO THE BRITISH FAUNA.

By Kenneth J. Morton, F.E.S.

The list of British Neuroptera, even when the term is used in its most comprehensive sense, is comparatively so short that any addition to it is a matter of considerable interest. It was therefore satisfactory to find in a small collection sent by Lt.-Colonel C. G. Nurse for determination a male example of *Nemoura* that seemed to be different from any of our known British species. Permission having been obtained to detach the abdomen for more thorough study, I am now able to determine the insect with certainty as *Nemoura dubitans*.

The specimen was taken at West Stow, Suffolk, on April 11th, 1910, and as the time and place of its occurrence are known to Lt.-Colonel Nurse, there is a reasonable hope that he will be able to find the insect in numbers.

The species was originally described in the Trans. Ent. Soc. Lond., 1894, p. 565, pl. xiii., from dried examples taken by Dr. Fr. Ris at Oerlikon, near Zürich, in April and May, 1889. Any hesitation about the validity of the species was dispelled by Dr. Ris, who made a preparation of the genitalia of the male type for his figures in his paper, "Die schweizerischen Arten der Perliden-Gattung *Nemura*" (Mitt. schweiz. entom. Gessellschaft, Bd. 10, Heft 9), and proved the species to be very distinct. It remained otherwise unknown until a male and a female were recorded by Petersen from near Randers, in Denmark ('Danmarks Fauna, Pseudoneuropteren'; Copenhagen, 1910).

AN ALGERIAN HOLIDAY.

By A. E. Gibbs, F.E.S.

(Plates V. & VI.)*

In May, 1910, I went with my family to Vernet-les-Bains, in the Eastern Pyrenees, in search of butterflies. The weather proved to be wet, windy, and cold, and although we had four nets at work, the result at the end of the first fortnight was so poor, and the outlook so unpromising, that I resolved to seek pastures new. If the sunshine would not come to me, I must go and seek the sunshine. From the hill-tops around Vernet it is possible to see the Mediterranean, and I remembered that on the further side of that sea was the land of Barbary. Surely there sunshine would be found, so I resolved to go and try my fortunes in the land of mosques and minarets. Leaving my family in the comfortable quarters of the Hotel Mercador, at Vernet, I sailed from Port Vendres and arrived at Algiers on Monday, May 23rd. The weather continuing unsettled, a couple of days were spent exploring the sights of this bewildering city, where the Orient seems to meet the Occident, the North the South. Mingled with plants and trees familiar to our English eyes one finds vegetation of a semi-tropical character. The squares are shaded by palms; avenues of eucalyptus trees are planted along the roads; in the gardens one gets glimpses of orange trees with their golden burden, or of lemons heavy with fruit. The only butterflies I saw in Algiers were some "whites," probably *Pieris rapæ*, and a single specimen of *Gonepteryx cleopatra*, flying in the Arab cemetery.

The physical features of Algeria present some points of interest. The country may be divided into three regions. First, we have what is known as the Tell, the narrow strip of cultivated land lying between the mountains and the sea. It is some hundreds of miles in length, and varies in width from about thirty to about one hundred miles. It is not, however, one long continuous plain, but is broken up by the hills into various small parts. The Tell is one of the most fertile regions in the north temperate zone, its rich black deep soil yielding abounding crops of grain. Oranges, lemons, figs, pomegranates, olives, and other fruits flourish. Then we have the second region formed by the elevated land behind the Tell, and spoken of collectively as the Atlas. In the north we have the range known as the Little Atlas. Although the general direction of the mountains is east and west, the Atlas does not form one long continuous range, as we find in the Pyrenees for instance, but it is split up into a number of small ranges or spurs, in complex folds, sometimes forming groups of high mountains, and sometimes rugged hills of much lesser altitude. Away to the south there is another range which is spoken of as the Great Atlas or the Atlas of the Sahara, and these two belts of mountains form the retaining walls, so to speak, of the high, barren, uncultivated plains covered with esparto grass and interminable scrub, known as the High Plateaux. Further south, beyond these highlands, we reach the third region, the Great Desert, with its waterless plains and sands, which are a barrier that few animals can pass, and form part of the southern boundary of the Palæarctic region. My collecting was chiefly done on the lower slopes of the mountains immediately above the Tell, and I was not able to investigate the insect fauna of the higher altitudes.

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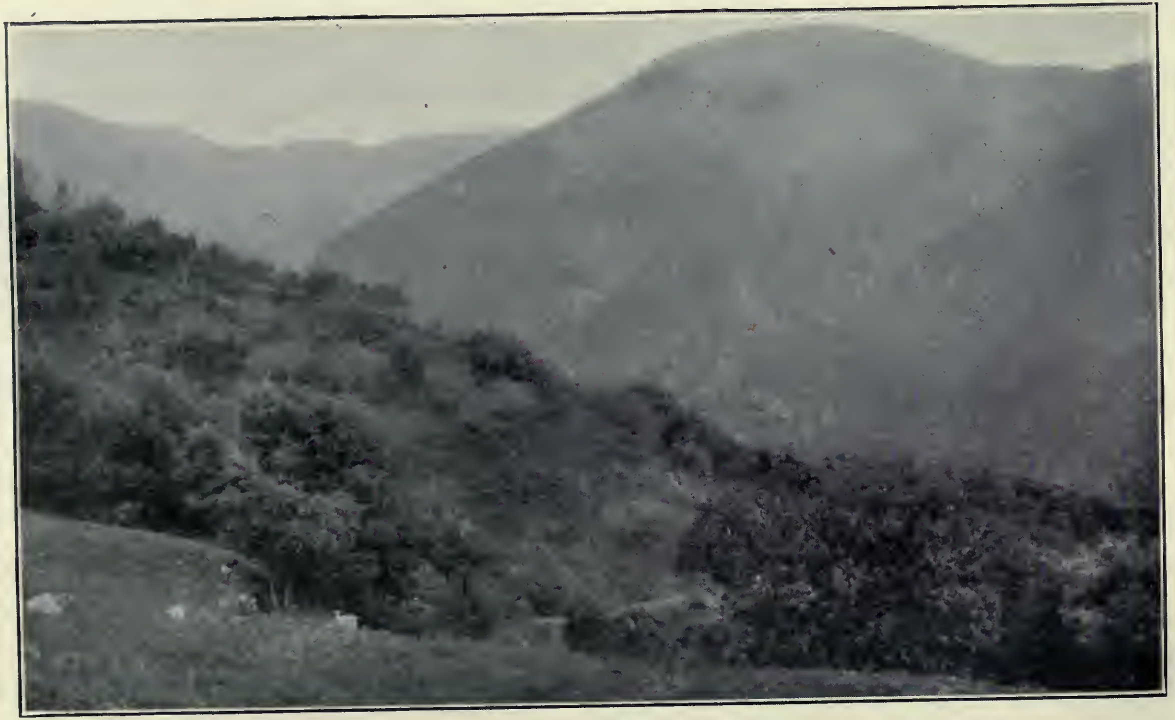
* Plate VI. will appear in the 'Entomologist' for May.

I unfurled my net at Blidah, an interesting little walled town pleasantly situated at the foot of one of the spurs of the Atlas. Blidah is surrounded by orange and lemon orchards, olive groves and vineyards, and has a very attractive appearance. Immediately I had secured accommodation at the hotel, I made my way through the nearest town gate and found myself on the river bank. Crossing by a footbridge I climbed the hill and presently found a grassy and sheltered hollow where I caught a *Cœnonympha*, which I took to be *C. arcania*, but a second glance revealed the large apical ocelli of the under sides of the fore wings and the narrow white bands, little more than lines, on the hind wings, and I was delighted to recognize that I had already secured a species which was new to me, and which I could not name until I returned to England, when I found it to be *C. arcanioides*, Pier. Needless to say, I searched for others, and by beating the herbage five specimens were secured. The southern, brightly coloured form of *Parage egeria*, not differing greatly from those I had been taking at Vernet, was also in evidence, and was a common species in Algeria wherever I collected. In the west of the colony I subsequently took females that I suppose would be referable to var. *intermedia*, Tutt, some of the markings being straw-coloured, as in our British *P. egerides*, giving the insect a mottled appearance. *G. cleopatra* in excellent condition, the only one I actually caught in Algeria, was overtaken flying along a hedgerow. *Pieris rapæ* and *P. napi* were also taken, but proved to be quite ordinary forms of those species and indistinguishable from those I get in my garden at St. Albans. The first-named insect, *P. rapæ*, was in great abundance wherever I went, but this is the only record I have of the occurrence of its congener in Algeria. Of *P. rapæ* I took a long series in various places, hoping to find *P. manni* among them, but in this I was disappointed. The bag also included *Pyrameis cardui* and *Rumicia phlæas*. The sunshine had made my heart rejoice, but while I was at lunch the clouds rolled up again, and entomological work for the day was over. I beguiled the time seeing the sights of the town and watching the Arabs buying

The Entomologist, April, 1911.

PLATE V.



A. E. G., PHOTO.

G. & B., LTD., IMP.

WHERE EUPHENO FLIES.

The Atlas above Blidah.

and selling in the native market. The plants and trees in the gardens surrounding the suburban villas and in the public park proved to be of great interest, while a grove of old olives, gnarled and weather-worn, surrounding the tomb of a holy man was very attractive. Early next morning I started for the mountains, accompanied by an Arab guide named Mohamet-ben-Hamet Kenitchou, whom I had picked up in the street, or, rather, who had picked me up, for he attached himself to me and because of his importunities I engaged him. The weather looked more promising and I hoped for great things, but, alas! my anticipations were again doomed to disappointment. The route first led through olive and fig gardens, above which we came to considerable stretches of arable land, and still higher was a zone of barren ground where grew bracken, asphodel, &c. Soon we entered a region covered with cistuses, hawthorns, genistas, and the scrubby dwarf oaks whose sweet acorns furnish food to the natives, and under their shade I found the mountain daisy (*Bellis montana*), beautiful tulips of a pretty orange colour, sedums and many other interesting plants. On this broken ground I took, during some brief intervals of sunshine, the few butterflies I caught on my climb. The bright yellow insect flying among the bushes was surely *Euchloë eupheno*, one of the butterflies I was especially anxious to obtain! A dash among the oaks and it was secured, and there without doubt was that lovely little Pierid in the net. Another, a female this time, made the pair, taken at Blidah, a spot at which in a decent summer I believe this species is to be found as abundantly as is its near relative *E. euphenoides* at Vernet. Later on I took another male at Tlemçen, but these were the only three specimens I saw. *Anthocharis belia* var. *ausonia* was added to the list, and a few *C. arcanioides*, three *Everes argiades*, and some insects of lesser note made up the day's catch. Most of the sport occurred in the neighbourhood of the little hotel known as La Glacière, where we had lunch, and here I believe very passable quarters may be found. It is apparently an excellent locality, and under better meteorological conditions would repay working. Resuming the climb we reached the cedar forest, where there are some very fine trees to be seen. Mounting still higher we attained the summit of Abd-el-Kadir, about 5350 ft. above the sea-level. Unfortunately the mountain was enveloped in cloud, but after waiting some time the mists at last divided and we got a glimpse, though only a momentary one, of a glorious landscape, the flat fertile plain stretching right away to the hills on the coast which shut out the view of the sea. On the journey home Mohamet lost his way, and we were wandering about a considerable time before he found his bearings. When we arrived at Blidah he demanded double pay. Had he not missed the path and so gone further than he bargained for, and, besides, had he not worn out his slippers scrambling over the rough hillside in my service! After a good deal of talk the matter had to be compromised, and I was glad to get rid of him.

I arrived late at night at Hammam R'Irha, a well-known bathing resort with a very comfortable hotel, situated among the mountains some distance to the south-west of Blidah, at an elevation of 1900 ft. above sea-level. When I left my bedroom in the morning I found that I had reached a very charming spot. As I sat at breakfast some pretty birds of a species unknown to me were pecking the dates from a palm outside the window. The air was filled with a delicious perfume from the roses and other flowers growing in the extensive gardens, and the sunshine made the place seem a veritable paradise. But, as was so often the case, a bright morning was followed by a gloomy day. Hurrying out with my net I worked round the gardens and then along a road leading to the forest. In a meadow by the wayside I was pleased to take the beautiful Algerian form of *Epinephele jurtina*, known as *fortunata*, which very much resembles the better-known *hispulla*, but is larger and more brilliant. Especially is this the case during life, for when killed much of the brightness which is so striking a feature in the living insect disappears. After this there was no more sun, and consequently no more butterflies, but in a forest clearing I found at rest on the flower heads a Zygænid which I have not yet determined. I struck a woodland path along which I wandered until it began to rain, when instead of retracing my steps I tried to take a short cut through the undergrowth and, of course, lost myself. The rain became a steady downpour, a state of things for which I was unprepared. After a rough-and-tumble scramble up and down the mountain-side I at length hit upon a clearing where an Arab boy was at work, and he showed me the way down into the valley. Here I found some native dwellings, and the Arabs told me to follow a cart track, which ultimately led me to the hotel. The remainder of the day had to be spent indoors, for the heavy rain continued until evening. The day's bag consisted only of three burnets, two *E.* var. *fortunata*, one *Colias edusa*, one *E. megæra*, and one *E. egeria*. Towards evening the storm abated and I determined to push on towards the Great Desert by way of the Saida and Colomb Béchar Railway, which joins the main Algiers-Oran line at a place called Perrégaux. In order to catch the west-bound night express, I had to change trains at the little station of Afronville, when a wait of two hours was relieved by catching a few Noctuæ on the station lamps and by watching the comet—Mademoiselle Halley, the French called it—which was shining with great brilliancy, and quite came up to one's idea of what a respectable comet ought to be. At five o'clock the next morning I was awakened by the guard, and turned out of my berth to find we were approaching Perrégaux. From here we travelled through a poor country, with range after range of low barren hills, a very different land from the rich and fertile plain I had left behind me. About mid-day we reached Saida, a garrison town newly laid out, and in a very unfinished condition, with an indifferent hotel. The morning had again been a fine one, and immediately after lunch I hurried out of the town, and near a negro village found a grassy place by the river which the rains had turned into a swamp. However, I trampled up a number of *E.* var. *fortunata*, all males, and a *Melanargia*, which turned out to be *M. lucasi*, a species of which I should no doubt have got a better series had the meteorological conditions been more favourable. The swamps and ditches and very wet grass prevented me working the ground properly, and there was no sun to make the insects fly, so I only succeeded in catching two specimens and a half, for number three had received unwelcome attention from a lizard or a bird, and had lost a large part of both of the hind wings. Others were seen, but a chase was impossible. Several Pierids were captured, which proved to be quite ordinary *Pieris rapæ*, but one nice specimen of *Anthocharis belemia* var. *glauce*, helped to make amends. While I was watching an Arab funeral cross the bridge I noticed that heavy clouds were rolling up and the sky became so threatening that I thought it advisable to return to the hotel and make the best of the sorry comfort it afforded. Hardly had shelter been gained when the storm broke and there was another of the deluges of rain to which I was getting accustomed in Algeria. There was no train leaving for the south until the evening of the following day, so I made up my mind to retrace my steps to the more fertile and attractive regions near the coast. At five o'clock on the morning of May 29th, when I left Saida and turned my face north again, the rain was coming down as hard as ever, and so it continued for the greater part of the day. As we got near Oran the weather cleared up again, and from the carriage window one could see *Pieris rapæ* and *Colias edusa* flying in the cornfields.

Oran is a large and important place of 88,000 inhabitants, about half of whom are French, and the district round is highly cultivated. On the morning after my arrival a visit was paid to the racecourse, not for the usual purposes for which such places are frequented, but because the landlord of the hotel thought it was the most likely place for butterflies. Alighting from the tram the exhilarating sight of *Dryas pandora* raised hopes of better fortune. *Pandora* is a strong flier, and the chances of taking it on the wing are not great, and a hot run only ended when my quarry sailed lightly over a garden wall and became lost to sight. The two Pierines I had seen from the train were flying everywhere, and so too was that ubiquitous insect, *Pyrameis cardui*, which is very abundant in Algeria. From some low bushes I turned out *Epinephele passiphæ* var. *philippina*, but the strong wind which was blowing in this very exposed place allowed me to secure only two of them, and they were not in prime condition; but a little further inland in a stoneyard I picked up *A. belemia* var. *glauce*. This was hardly out of the net before *C. edusa* var. *helice* attracted attention, and proved to be an extremely fine and large specimen, measuring when set 53 mm. from tip to tip of the expanded wings.

(To be concluded.)

A NEW GENUS OF AUSTRALIAN BEES.

By T. D. A. Cockerell.

In the 'Entomologist,' October, 1910, I gave an account of some small and very peculiar Australian bees. I have now received from Mr. Rowland Turner a number of specimens, including two new species which must be assigned to still another genus, remarkable for the fact that the third discoidal and second submarginal cells are completely confluent. The types will be placed in the British Museum.

Heterapis, n. gen.

Small bees related to *Euryglossa*; stigma large; marginal cell pointed on costa; first submarginal and first and second discoidal cells complete; third discoidal and second submarginal confluent, the nervure which should separate them wholly absent; lower section of basal nervure arched, falling far short of transversomedial; claws in female cleft, pulvillus large; anterior tarsi with modified hairs; suture between clypeus and supraclypeal area obliterated. Type *H. delicata*, n. sp.

Heterapis delicata, n. sp.

♀. Length about 3½ mm.; elongate, black, with hyaline wings; mandibles and labrum pale reddish, as also apical middle of clypeus; mandibles dark and bidentate at apex; inner orbits very narrowly margined with yellow; antennæ pale beneath, including a stripe on scape; abdomen faintly purplish, the first segment smooth, the others microscopically transversely lineolate. Ocelli large, in a triangle; head oblong, like some Proctotrypid; mesothorax very minutely punctured and lineolate; metathorax elongated, longer than broad, with a large upper surface, which is microscopically cancellate; abdomen not much longer than thorax. Anterior tibiæ yellow in front; hind tibiæ with base broadly yellowish-white; anterior tarsi pale reddish, beneath with curious thick subclavate hairs; claws bifid at end; pulvillus very large. Base of mandibles making an angle with base of eye, as in *Turnerella*; facial foveæ linear; clypeus not defined above, but from its lateral sutures evidently very high, its upper suture wholly wanting, its surface with sparse minute piliferous punctures and feeble microscopical lineolation; antennæ 12-jointed, joints beyond the fourth with small oval whitish pits; long branched hairs on abdomen beneath near end, and short plumose ones about tubercles. Stigma and veins dark brown, well formed; in the following account of the wing the measurements are in microns (the same also under the next species); stigma very large and deep, its depth 153; marginal cell sharply pointed on costa, its length on costa 357, its lower side beyond the submarginal cells slightly arched inward; first submarginal long, its length 290; second submarginal on marginal 85, its lower side absent; upper section of basal nervure 34, lower (not allowing for the curve) 220; basal nervure from transversomedial 60, the latter oblique, and bent at its lower end; first recurrent nervure joining first submarginal cell 12 from its end.

Hab.—Mackay, Queensland, December, 1899 (*Turner*, 388).

Heterapis sculpta, n. sp.

♀. Length about 4 mm.; slender; head and thorax black, abdomen shining rufopiceous; tubercles margined with yellow; mandibles ferruginous, dark at extreme base, feebly bidentate at apex; labrum dark; scape in front and flagellum beneath pale yellowish-ferruginous; knees, anterior tibiæ, middle and hind tibiæ at base and apex, and all the tarsi, pale ferruginous; wings hyaline, very iridescent, nervures and stigma dark brown; tegulæ brown. Clypeus and adjacent sides of face microscopically tessellate, with large shallow punctures; clypeus very long, separated from the supraclypeal area by a slight depression, but no suture; supraclypeal area finely longitudinally striate; a fine longitudinal keel between antennæ and reaching far up front; ocelli large, middle ocellus 100 μ diameter; front very strongly punctured; second antennal joint oval, fourth and fifth very short; flagellum stout, subclavate, the penultimate joint 135 μ diameter; mesothorax shining, strongly and very regularly punctured; abdomen beyond first segment finely transversely lineolate; metathorax microscopically reticulate. Claws deeply bifid, pulvillus large; anterior tarsi with hooked bristles; hair on under side of abdomen branched on one side. Stigma large, only moderately deep, its depth 153; second submarginal and third discoidal cells completely confluent; upper section of basal nervure 102; lower section very strongly arched, falling 135 short of transversomedial; marginal cell 714 long, pointed on costa; first submarginal 460; second submarginal above 93, its lower side absent.

Compared with *H. delicata*, this is considerably larger; the head is differently shaped, being broad above, with the eyes strongly converging below; the metathorax is much less elongated, and is rounded in lateral profile (angular in *delicata*); the abdomen is broadest about the base of the second segment, whereas in *delicata* it is broadest about the middle of the third.

Hab.—Mackay, Queensland, May, 1900 (*Turner*, 1087).

Euryglossa perpusilla, Ckll., 1910.

Mr. Turner sends me several females of this species (*Turner*, 1085). The orange supraclypeal band is sometimes absent.

One specimen has a *Turnerella*-like venation, with only one submarginal cell and two discoidals. The shape of the remaining submarginal is as in *E. perpusilla*, not at all as in *Turnerella*.

Bombus bicoloratus.—In my note on this species, p. 101, I used the customary sign for workers, but for some reason the printer desired to spell it out, and rendered it "hermaphrodites."

NEW SPECIES OF SYNTOMIDÆ FROM BRITISH GUIANA AND SOUTH BRAZIL.

By W. J. Kaye, F.E.S.

Pterygopterus flavicornis, n. sp.

♀. Blue-black; antennæ orange, blackish close to base. Abdomen with metallic-blue patches at base, and an ill-defined lateral stripe of metallic spots. Fore wing with the outer marginal half dull blackish, the remainder of wing deep green. The median vein and upper discocellular bright blue-green. Hind wing dark shot blue-green. Under side of both fore and hind wings suffused with brilliant metallic-green, the veins at the margin of wings only so coloured, the interspaces black. Differs only from *P. clavipennis* (male) in the antennæ, which are wholly orange in the insect now described, while *clavipennis* has only the tips orange. Expanse, 56 mm.

The shape of the hind wing is totally different, but is probably a sexual difference. The female of *P. clavipennis* is unknown.

Hab. Potaro River, British Guiana, June 18th, 1904 (C. B. Roberts).

Pseudosphex polybia, n. sp.

Head black. Thorax black. Eyes finely white-ringed. Antennæ blue-black for basal two-thirds, the slender apical third dead black. Abdomen black, with an oblique whitish streak on attenuated basal segment at side. Fore wing yellowish hyaline, with the costa broadly suffused with brownish. Hind wing more yellowish hyaline. Legs yellow, with the inside of femur velvety black. Expanse, 26 mm.

Hab. Castro, Parana, Brazil, April 14th, 1910 (W. J. Kaye).

Pseudosphex jonesi.

Head black; eyes narrowly ringed with white. Antennæ purplish for basal two-thirds, brownish for the attenuated apical third. Abdomen shining brown above, ringed with yellow beneath. Wings hyaline with a tinge of yellowish. Legs yellowish, the femora darker. Expanse, 20 mm.

Hab. Alto da Serra, Santos, Brazil, March 6th, 1910 (E. D. Jones).

Rhyncopyga braconida.

Small white points below the eyes, on edge of patagia, and on base of fore wing below. Head and thorax dull lustrous green. Abdomen with the two basal segments crimson, the remaining segments greenish black. Legs greenish black, the third pair very long and white beneath at the joint of tibia and femur. Fore wing with basal half dark lustrous green, the outer half dull blackish. A large orange spot on costa beyond the cell. Hind wing blackish, slightly diaphanous. Expanse, 28 mm.

Hab. Alto da Serra, Santos, Brazil, March 6th, 1910 (W. J. Kaye.

Mystrocneme sectum, n. sp.

Frons white. A white spot on the shoulder. Thorax black, with a large metallic-green spot in centre; patagia with metallic-green spots. Collar with two metallic-green spots. Abdomen with a white sublateral spot at base, and with metallic-green lateral stripes. Fore wing black, with a small hyaline streak just below the cell. Hind wing entirely black. Expanse, 28 mm.

Hab. Potaro River, British Guiana, March 22nd, 1904 (C. B. Roberts).

Mystrocneme rubricorpus, n. sp.

Frons white. Collar with two green spots. A crimson spot at base of shoulder. Thorax black; patagia with slender metallic-green stripes. Abdomen with first and second segments scarlet, the third, fourth, and fifth scarlet laterally, black dorsally; the remaining segments black, with some metallic-green scaling laterally. Fore wing hyaline; the apex broadly black; a large black square-shaped patch at tornus; inner margin broadly black; the costa narrowly black. Hind wing hyaline, with a broad black margin; the cell area black. Under side of hind wing with metallic-green scaling at base of costa and in cell. Tibia with metallic-green scales on outside. Expanse, 28 mm.

Hab. Potaro River, British Guiana, April, 1903 (C. B. Roberts).

Mystrocneme albicorpus, n. sp.

Black; frons, shoulders, and coxæ with white spots. Legs outwardly with metallic-green areas. Abdomen with the basal segment white, and the second segment edged internally with white; laterally these two segments are overlaid with pale metallic-green; the other segments green laterally and black dorsally. Abdomen beneath with a central broad whitish stripe, and a short whitish lateral streak on two first segments. Fore wing hyaline, with a broad black apical patch, and a broad black area across cell. Hind wing hyaline, the margins broadly black. Expanse, 28 mm.

Hab. Potaro River, British Guiana, June, 1903 (C. B. Roberts).

Napata subflavescens, n. sp.

Base of antennæ with small white points; front edge of patagia orange. Thorax and abdomen blackish brown. Fore wing brownish black, with a broad transverse ochreous band across middle; costal edge for some distance from base yellow. Hind wing wholly brownish black. Under side of fore wing as on upper side. Under side of hind wing pale yellow, with a broad marginal black band, and some blackish streaks in and about the cell; the marginal band near anal angle is broken with a wedge of pale yellowish. Expanse, 33 mm.

Hab. Bartica, British Guiana, April 7th, 1910 (W. J. Kaye).

Saurita melanifera.

Head, abdomen, thorax, antennæ, fore wing and hind wing, both above and below, completely sooty black. Expanse, 27 mm.

Hab. Guaruja, Santos, South Brazil, March 2nd, 1910 (W. J. Kaye).

Saurita mediorubra, n. sp.

Head, thorax, and abdomen black. Large crimson spot at base of patagia, and another large crimson spot in the centre of the first segment. Fore wing semihyaline, the apex broadly black; some dark scaling at tornus, and at base and along inner margin for a short distance. Hind wing semihyaline; the apex and inner margin with some dark scaling. Legs entirely black, and under side of abdomen entirely black. Expanse, 34 mm.

Hab. Guaruja, Santos, South Brazil, May 9th, 1910 (E. D. Jones).

Trichura grandis, n. sp.

Frons metallic-green. Head, thorax, and abdomen black, the latter with a few lateral shot-green spots; at base of first segment a metallic-green central spot. Fore wing ochreous hyaline; costa margined narrowly on outward half with blackish; outer margin narrowly black, slightly extending inwards near tornus; inner margin very narrowly blackish. Hind wing hyaline, almost devoid of colour; the apex and inner margin broadly black; outer margin very lightly margined black. On under side pairs of subdorsal white patches on third and fifth segments. Legs black, shot with dark green. Expanse, 50 mm.

Hab. Guaruja, Santos, South Brazil, February 27th, 1910 (W. J. Kaye, E. D. Jones).

Leucotmemis bella, n. sp.

Frons white. Two metallic-blue spots behind the eyes. Collar orange. Thorax and patagia orange. Abdomen orange, with a slender dorsal line of metallic-blue spots; last four segments black, with patches of metallic-blue scales. Fore wing yellowish, transparent, the basal two-thirds of costa and basal half of inner margin orange; apex broadly black, and outer margin narrowly black, very slightly extended inwards at vein two. Hind wing hyaline, with inner margin and apex broadly black. Legs with coxa and femur orange, tibia blackish, tarsus whitish. Under side of abdomen orange, the last four segments black. Expanse, 27 mm.

Hab. Alto da Serra, Santos, Brazil, March 6th, 1910 (W. J. Kaye).

Loxophlebia inconspicuata, n. sp.

Head black. Thorax and patagia brick-red. Abdomen brownish black, with a sublateral whitish line. Fore wing transparent, with the margins narrowly black, and the base markedly black. Hind wing transparent, slenderly margined with black. Legs brownish, with patches of whitish scales. Expanse, 19 mm.

Hab. Potaro River, British Guiana, March 25th, 1903 (C. B. Roberts).

Loxophlebia fininigra, n. sp.

Palpi black, with white rings at the joints. Head black, with white points above and below antennæ. Thorax orange. Abdomen orange; seventh and eighth segments black, ninth segment metallic-greenish. Fore wing transparent, the base orange; the apex broadly black, and outer margin narrowly black, extending inwards at vein two. Hind wing transparent, the margin narrowly black. Antennæ black, the tips brown, preceded by a short length of white. Under side of abdomen black, with a large white basal patch. Expanse, 22 mm.

Hab. Guaruja, Santos, South Brazil, April 17th, 1910 (W. J. Kaye).

Mesothen perflava, n. sp.

Palpi black; frons white; back of head black. Collar yellow; patagia yellow, with a central black line. Thorax yellow, with central black line continuing down the back of the yellow abdomen to the fifth segment; segments six and seven wholly yellow; the eighth blackish, and the last black, with two patches of white scales. Fore wing hyaline; no discoidal spot; the margin narrowly black, except the apex; nervures at base yellow-scaled. Hind wing hyaline, narrowly margined with black. Legs yellow, edged with black on the outside. Expanse, 24 mm.

Hab. Alto da Serra, Santos, Brazil, 2600 ft., March, 1910 (E. D. Jones).

Allied to *Mesothen rogenhoferi*, Schs., and perhaps only a variety of same.

Argyroeides variegata, n. sp.

Head black, thorax black, the patagia with crimson stripes. Abdomen black; the second, third, and last three segments with dorsal pairs of pale blue spots; the fifth segment with a partial yellow band. Fore wing diaphanous; the discoidal spot narrow, brown, and margins all very narrowly bordered brown. Hind wing as fore wing, narrowly margined with brown, except on inner edge; tibia crimson. Expanse, 23 mm.

Hab. Fernandes Pinheiro, Parana, 2600 ft., April 12th, 1910 (E. D. Jones, W. J. Kaye).

Correbidia tristitia, n. sp.

Palpi with the first and second joints ochreous beneath, black above. Frons and collar ochreous, mixed with dull brownish black;

patagia ochreous near head, becoming dark brownish. Fore wing at base purplish black; a broad fascia and broad apical patch purplish black; a yellow basal and postmedian band, the latter widening greatly at tornus, and waved at vein three. Hind wing dull semi-transparent ochreous; a dark triangular patch extending inwards from costa, becoming very well-defined on outer edge; outer margin pale purplish black. Expanse, 33 mm.

Hab. Rockstone, British Guiana, April, 1901 (W. J. Kaye).

Pheia bisigna, n. sp.

Fore coxæ white. Thorax black; patagia with a large crimson spot. Abdomen with pairs of white patches on first and second segments; other segments black. Fore wing with a minute crimson point at base, a broad sharply cut-off black apical patch, and narrow costal and outer marginal black bands; discoidal spot narrow, black. Hind wing hyaline, the apex broadly and outer margin narrowly black. Under side of abdomen silvery white on first five segments. Expanse, 27 mm.

Hab. Potaro River, British Guiana, May, 1902 (C. B. Roberts).

Heliura fulvipicta, n. sp.

Fore wing narrow, elongated, brownish, with darker black-brown markings; a broad black-brown median fascia and broad apical patch; base blackish brown; nervures very dark; a bright yellow spot at base. Hind wing hyaline, with a very broad black margin. Head with two yellow spots behind the eyes. Thorax and patagia black-brown. Abdomen black, with a yellow basal spot. Under side of abdomen with two large white patches on third and fourth segments. Expanse, 35 mm.

Hab. Potaro River, British Guiana, June, 1903 (C. B. Roberts).

WHAT HAS BECOME OF THE BRITISH SATYRIDÆ?

By Prof. R. Meldola, D.Sc., F.R.S., F.E.S., &c.

Among the reminiscences of my early collecting days some forty odd years ago is the abundance of certain species of Satyrid butterflies in the London district in localities from which they have now disappeared altogether, or have become so scarce as to appear notable when observed. It is not altogether a case of "urbanization," because many of the districts frequented by me in my youth, such as Epping Forest, the chalk downs south of Croydon, &c., are still open spaces and more or less rural. Moreover, the species which I have in mind are generally less abundant all over the country than they used to be, so that some wider cause than the spread of cities must be sought for. It is noteworthy that the Satyridæ should apparently be so especially affected by adverse conditions. Let me, in the first place, state the facts from my own memory. In the late sixties and early seventies *E. ianira* was abundant round and about Leyton, in Essex, and in the Epping Forest district generally. It swarmed among the long grass of the Hackney Marshes and all along the Lea Valley. It is now a comparative rarity in this district; two years ago a few specimens were noted, as a kind of curiosity, in the marshes between Ponders End and Chingford, but the predominance of this species is evidently a thing of the past. During the same period *P. egeria* used to sun itself on the southern wall regularly every summer in our garden at Leyton, and was fairly common in the Forest. I have not seen it in the latter district for more than twenty years. So also *P. megæra*, which could always be seen in the Forest glades, has practically disappeared from this locality. The same remark applies to *E. hyperanthes*, which used to flutter in swarms over the bushes in the Forest, and which is now quite extinct in the district, according to my experience. *E. tithonus* was never common in the Forest or its environment, but could always be seen at the right season. In the country round Twickenham and Anerley, which I also used to frequent at that time, this butterfly was quite a conspicuous feature of hedgerow insect life. I have seen the bramble-flowers crowded with this butterfly season after season, and, paraphrasing Hans Breitmann, I ask, "Where is that species now?" At the time referred to, the chalk downs along the Caterham Valley (Riddlesdown, &c.) used to be favourite localities with collectors. The commonest Satyrid then was *S. semele*, which was out with *L. corydon* (common), *L. minima* (rare), and *Z. filipendulæ* (abundant). One morning's visit to Riddlesdown at that period sufficed to fill up one's "series" of all these species. *Semele* has disappeared from the locality, so also, according to my experience, has *L. minima*. *L. corydon* and *Z. filipendulæ* still linger on in the more remote and less frequented coombs of the chalk downs, but they have disappeared from their former habitats, and are getting scarcer in their present localities.

The question raised in this note is, of course, only part of the general question of the causes of the fluctuation in numbers of British species. The answer cannot be given in terms of one factor: it is not always a simple case of the over-running of localities by "humanity," because I have found, and my experience is confirmed by others, that the decline of the Satyridæ is pretty general. The causes which in districts undergoing "urbanization" are operative to the extent of producing local extinction appear to be also operative, although in a lesser degree, in the rural habitats of those species which used formerly to be abundant. What these causes are I am not prepared to state dogmatically, but it seems to me worth while putting my recollections upon record before they fade, for there must be many of my contemporaries whose experience of former times will coincide with mine. Other species and the representatives of other families have, as we all know, been observed to decline locally, but in no other case within my knowledge has such a general family decline been noticed as that which is made manifest in the Satyridæ by a comparison of the present state of affairs with that which existed forty years ago. It has been suggested, and with some reason, that the protection in modern times of small birds by Act of Parliament has some connection with the decline of certain British species of Lepidoptera. This may be the case, and, if so, the enemies of the Satyridæ must be sought for among those insectivorous birds which hunt among grasses for food, for the larvæ of this family are all grass feeders. To this suggested cause may be added the fact that the Satyridæ are not migratory, and that losses by increased persecution are not made good by occasional immigration from the Continent, as is the case with the Vanessidæ. It is also possible that improvements in agricultural practice have had something to do with the decline of some of the grass-feeding species, but this cause can hardly be assigned in the case of species which frequent woodlands and heaths. I may add, with reference to the latter, that even the commonest of the heath-frequenting species, *C. pamphilus*, is a rarity now in the districts referred to as compared with its abundance in former times.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 111.)

Macrocilix taiwana, sp. n.

♀. Head white, face brown; thorax and basal segment of abdomen white; rest of abdomen partly denuded, but appears to have been brown. Fore wings white with fuscous grey transverse markings; antemedial line double, wavy, angled near costa; postmedial band wavy, angled near costa, traversed by two white lines, and crossed by the white veins; a black mark in band near inner margin, and a curved tawny streak from end of cell almost to outer angle; submarginal band not extending to costa. Hind wings white, with two blackish dots about the middle of inner margin, and a black-brown cloud at anal angle; the fuscous grey postmedial band, which does not extend above vein four, is traversed by two wavy white lines. Fringes of all the wings greyish tipped with darker, preceded by black lunules. Under side whitish, with blackish macular lines on the outer area of all the wings; the basal half of the fore wings clouded with fuscous.

Expanse, 42–48 millim.

Collection number, 1225.

Two female specimens. One from Arizan (7300 ft.), August, 1908; the other from Rantaizan (7500 ft.), May, 1909.

Deroca arizana, sp. n.

♀. Wings hyaline, with traces of greyish transverse lines; some greyish clouds on the outer margin, marginal line greyish interrupted by the whitish veins.

Expanse, 30 millim.

Collection number, 1697.

One female specimen from Arizan (7500 ft.), June, 1908.

Oreta brunnea, sp. n.

♂. Head chocolate-brown; thorax brown, greyish tinted in front; abdomen brown inclining to reddish. Fore wings brown, flecked with greyish on basal area; a dusky antemedial shade; postmedial line dark brown, almost blackish, outwardly edged with greyish, and most distinct towards apex; it runs from just beyond middle of the inner margin to apex. Hind wings obscure reddish brown; indications of a dusky antemedial line, a few black dots on the outer margin near anal angle. Fringes of all the wings reddish. Under side orange-red, freckled with brownish; outer area of the fore wings washed with greyish.

Expanse, 41 millim.

Collection number, 1242.

One male specimen from Arizan (7300 ft.), August 24th, 1908.

Oreta purpureofascia, sp. n.

♂. Fore wings light brown, with reddish brown ante- and postmedial lines, the latter angled near costa; space between the lines purplish brown, and this colour extends along the inner margin to the base. Hind wings have the basal half purplish brown, limited by a reddish brown line, and the outer half light brown. Under side ochreous brown, sparingly freckled with blackish.

Expanse, 34 millim.

Collection number, 1244.

ab. *unicolor*, nov.

All the wings purplish brown, lines reddish brown as in the type.

Both type and aberration are from Kanshirei; the former was taken in May, 1907, and the latter in July, 1908.

Near *O. olga*, Swinhoe.

Aroa nigrofascia, sp. n.

Fore wings brown, clouded with blackish at the base, and along the costal area almost to apex; antemedial band blackish, nearly straight; a blackish reniform mark at end of the cell; postmedial line blackish, diffuse, wavy, excurved below costa; a series of blackish lunules on the outer margin, preceded by some blackish dots, near the costa and the inner margin; fringes faintly chequered with blackish. Hind wings brown, suffused with blackish, chiefly on the costal and outer areas; fringes pale greyish brown. Under side brown, rather paler than above; on the fore wings the cell, inner end of space below, and submarginal series of spots, blackish; on the hind wings the discal and submarginal spots blackish.

Expanse, ♂ 34 millim., ♀ 38 millim.

Collection number, 667.

One example of each sex from Kanshirei (1000 ft.); the male captured in July, 1908, and the female in April of the same year.

Euproctis simplex, sp. n.

Antennæ ochreous, shaft whitish. Head and thorax pale ochreous, abdomen ochreous, greyish tinged on middle segments. Fore wings white, slightly tinged with pale ochreous at base; fringes silky.

Expanse, 23–26 millim.

Collection number, 742 *b*.

Two male specimens from Kanshirei (1000 ft.), May, 1908.

The abdomen of the smaller specimen is less ochreous.

Palimpsestes taiwana, sp. n.

♀. Fore wings greyish white, clouded with blackish at the base; antemedial band dark grey, margined by wavy black lines, and traversed by a third line similar to the other two; medial line black, double, elbowed above middle, angled before the inner margin, commencing in a black patch on the costa, marked with black on the veins; postmedial line, curved below costa, composed of black and white dots; a submarginal series of more or less triangular spots, inwardly edged with blackish, and outwardly by a black line running to apex; orbicular and reniform marks whitish, outlined in blackish; veins dotted with white, some white dots on the costa towards apex; marginal line black, wavy; fringes pale grey, marked with darker. Hind wings whitish, suffused with pale fuscous, traces of a pale postmedial band; fringes whitish.

Expanse, 46 millim.

ab. *obsoleta*, nov.

♀. Base of fore wings not clouded with blackish; only the costal half of antemedial band and the costal spot of medial line clearly defined; a series of dusky longitudinal bars before the postmedial line, the later more distinct.

Expanse, 44 millim.

Collection number, 1768.

Both specimens from Rantaizan (7500 ft.), where they were captured in May, 1909.

Polyploca ænea, sp. n.

♂. Head and collar brown; thorax brown, ochreous tinged; abdomen paler. Fore wings pale bronzy brown, suffused with darker, and rather glossy; a black dot near base; antemedial line black, double, slightly curved; medial line black but faint, double, elbowed above middle, angled above inner margin where it is edged by a pale patch; postmedial line black, wavy, confluent with medial line on the inner margin; submarginal line pale, wavy, commencing in a pale spot, the lower edge of which is black; stigmata indistinct; veins marked with black; fringes pale. Hind wings pale brown, suffused with fuscous on outer area.

♀. Similar to the male, but the head and collar are not darker than the thorax.

Expanse, ♂ 40 millim., ♀ 38 millim.

Collection number, 1222.

One example of each sex from Kanshirei (1000 ft.); the male taken April 27th, 1908, and the female, May 29th of the same year.

Phragmatæcia fusca, sp. n.

♀. Head, thorax, and fore wings smoky brown; hind wings pale brown, smoky tinged; abdomen pale brown, posterior edges of segments darker. Fringes pale brown. Under side of all wings smoky.

Expanse, 50–53 millim.

Collection number, 670*b*.

Two female specimens from Kanshirei (1000 ft.), April 27th, 1908.

Phragmatæcia cinnamomea, sp. n.

Head and thorax velvety brown; abdomen pale brown, edges of segments fringed with darker. Fore wings pale cinnamon-brown, costa blackish to beyond middle; inner marginal area clouded with blackish; discoidal mark black, linear; blackish wavy streaks between the veins on the outer area; fringes marked with blackish at end of veins.

Expanse, 40 millim.

Collection number, 670.

One male specimen from Kanshirei (1000 ft.), April 27th, 1908.

Phragmatæcia obscura, sp. n.

Head and thorax dark brown; abdomen pale brown, segments fringed with darker. Fore wings dark fuscous brown, sprinkled with blackish, especially on the inner marginal area; two blackish dots at end of cell, the upper faint. Hind wings and under side of all wings pale fuscous brown.

Expanse, ♂ 32 millim., ♀ 37 millim.

Collection number, 670*a*.

One example of each sex, both rather worn, from Kanshirei (1000 ft.), April 17th, 1908.

Susica formosana, sp. n.

♂. Glossy pale brown, thickly powdered with black scales, especially on basal two-thirds of the costal area; a slightly curved narrow band from the costa, about one-third from apex to the inner margin near base, is of the ground colour, almost free of darker scales, but with traces of a darker line running through it; a clear streak of the ground colour, from the costal end of the band almost to inner angle, diffuse; a black dot at end of cell. Hind wings glossy pale brown, slightly suffused with fuscous; veins dotted with black on the outer area. Under side pale brown, sparsely freckled with darker on the costal area of all the wings; veins paler, glossy.

Expanse, 34 millim.

Collection number, 662*a*.

A male specimen from Kanshirei (1000 ft.), May 11th, 1907.

Allied to *S. pallida*, Walk.

(To be continued.)

BY THE WAY.

We were once asked whether entomology was an "exact" science. We answered in the affirmative, with the mental substitution of "exacting" in the place of "exact," having recently done some re-creative (not recreative) work on American-described Hymenoptera. As a matter of fact, the present condition of entomology in Britain is about as definite and exact as Lewis Carroll's "slithy toves," when they "did gyre and gimble in the wabe." The "wabe" in which we—er—gyrate and grumble needs crystallizing, the extent of present knowlege of the neglected orders tabulating, with the publication of statistics showing in what direction research work, both systematic and economic, is most necessary, practically and pure-scientifically.

One is moved to some discontent, such as the above, by the only too true remark of the 'Daily Telegraph' on March 3rd last: "We have in England no Government entomologist, no entomological experiment station, no organization which does for the country as a whole what economical entomologists do in India, in our dominions and colonies, and in the United States. And at present there is no course of lectures or training in entomology as a special subject given in England"; and the 'Morning Post' of 24th ult. epitomises a Press notice, which we also received too late for our last issue, thus: "In order to further the work of the African Entomological Research Committee Mr. Andrew Carnegie has given a sum of £1000 a year for three years, to defray the cost of sending qualified men to study the practical applications of entomology in the United States." The fact of the matter is that we in Britain take our entomology as a mere hobby; we ride it with so selfish a rein that we never touch what does not catch our instable fancy, and with so idle a spur that our spasmodic investigations are rarely more than *pour passer le temps*. We sincerely congratulate Mr. G. H. Grosvenor.

The rat-borne plague of the Ipswich vicinity, about which we heard so much last year (especially from Sir Edwin Ray Lankester, K.C.B., M.A., LL.D., F.R.S.), is at present lying *perdu*, and more or less strenuous efforts have been made locally—too locally to be effectual, we fear—to exterminate the carriers of the host-flea. Personally, we are inclined to consider the trouble a thing of the past; but Mr. R. C. Wroughton, late Inspector-General of Indian Forests, than whom no one is more competent to judge, tells us that the rats are likely to simply migrate inland and the scourge to again break out, possibly in the neighbourhood of Hertfordshire. Here, again, there is no home entomologist from whom to seek succour. The only account of the matter we have seen, in anything like permanent form, is contained in a brochure on 'The Death-dealing Insects and their Story,' a delightful little book by Dr. C. Conyers Morrell, of the Authors' Club, published by the H. A. W. Offices, Brazennose Street, Manchester, late last year.

During last month Mr. H. Maxwell-Lefroy, M.A., Imperial Entomologist, India, gave a course of lectures on Entomology at the Imperial College of Science and Technology, South Kensington. The course was opened on March 2nd, and continued twice weekly during the month. In conjunction with the lectures, which were free, a course of practical work was also available for students desiring to specialize in entomology. The average attendance at the lectures seems to have been about twenty, and a fair proportion of this number took the practical course, for which a small fee was charged. These lectures, with the class work, will be resumed in May and June next.

The Entomological Society of London proposes to hold a Conversazione in the Rooms of the Linnean Society, Burlington House, by kind permission of the President and Council of that Society, on Wednesday, May 17th, at 8 p.m. Lectures will be delivered during the evening, by Professor Poulton, F.R.S., F.L.S., &c., and Mr. F. Enock, F.L.S., F.E.S.

C. M.

NOTES AND OBSERVATIONS.

Remarkable Aberration of Terias elathea.—Those interested in the butterflies of the West Indies will be pleased to hear that when collecting here this morning, at an elevation of about 300 feet above sea-level, I had the good fortune to net a male specimen of *Terias elathea*, in which not only the black longitudinal dash on the upper side of the fore wings is practically absent, but the broad black borders are also entirely replaced with yellow; only the very faintest grey outline, scarcely visible to the naked eye, indicates the inner margin, to where the black border would have extended. The hind wings of this beautiful specimen are entirely white, save only for a faint grey scalloped edging slightly increasing towards the anal angle, again indicating to where the black border was meant to have extended, had the specimen been a normal one. The under side is much the same as usual, only rather pale. I should be interested to know if others who have collected in this part of the world have ever met with this form of *T. elathea* before? — MARGARET E. FOUNTAINE, F.E.S.; Montego Bay, Jamaica, February 13th, 1911.

NOTE ON TROCHILIUM APIFORME.—Lt.-Colonel Nurse in his article on the Sesiidæ, published in the March issue of the 'Entomologist,' questions Barrett's statement about the larvæ of *Trochilium apiforme*. I worked for this species last April in the Fens, where most of the black poplars are infected. I then found the insect in three stages: (1) half-grown larvæ low down in the roots; (2) full-grown larvæ in their pupating tunnels—these, when disturbed, withdraw into the tree and were not easy to get out; (3) cocoons, just under the bark. From this I gather that the larva stage probably lasts only two years, and that many of the larvæ certainly do not form their cocoons till April or May, though the majority seem to do so earlier. The few cocoons that I examined held either larvæ or freshly changed pupæ. My treatment of both larvæ and pupæ was not satisfactory; the former without exception died, while of the latter about fifty per cent. emerged late in June, the rest became mouldy. Probably I kept them too moist, for fear that the cocoons should contract and damage the pupæ. I should welcome a note from any correspondent on the best method of keeping Sesiidæ pupæ.—J. S. CARTER; Warren Hill, Eastbourne, March 5th, 1911.

THE ITALIAN FORMS OF ZYGÆNA TRANSALPINA, Esp.—In 'Bollettino del Laboratorio di Zoologia Generale e Agraria,' vol. iv. pp. 134–161, Conte Emilie Turati discusses the variation of *Zygæna transalpina* in Italy. Fifteen new forms are named, thus increasing the number of known forms to thirty-eight.

FOOD OF VANESSA ANTIOPA LARVÆ.—With reference to Mr. A. H. Jones's note in the 'Entomologist,' p. 112, on the larvæ of *V. antiopa* being in his experience essentially sallow feeders, it may interest him to know that in 1892 I reared about seventeen or eighteen hundred specimens of this fine butterfly from eggs deposited on willow by captive females, kindly sent me by Mr. Frederick Raine from Hyères, and that over one thousand were fed exclusively upon willow, but I found sallow appeared equally suitable for food, also birch was readily eaten, even when willow had formed the sole food until the last stage. They also fed well on elm; nettles, however, did not appear suitable as food, and was not touched by them during the last two or three stages; it was only when quite young that they could be induced to feed upon this plant, and although they fed for several days on nettles, they did not thrive, and eventually died. In some localities I believe birch is usually the chief food of this species. As I have before stated, there is no authentic instance of either the eggs, larvæ, or pupæ of *V. antiopa* ever having been found in the British Islands. From the large size, velvety black colour, and gregarious habits of the larvæ, they would form a most conspicuous object on the foliage of any tree; it is obvious that if they existed in this country they could hardly have escaped detection.—F. W. Frohawk; March, 1911.

Amphidasys betularia ab. doubledayaria in Essex.—My experience certainly endorses that of Mr. Mathew, given on page 67 of this year's 'Entomologist,' as to the comparative frequency of the occurrence of *doubledayaria* in Essex. On June 9th, 1909, I bred a normal female from a larva obtained in my garden at Westcliff-on-Sea, on Michaelmas Daisy, the previous year. In the evening, I hung her up in a gauze cage to a lime tree in the garden, and, although it was a bad evening, she attracted three males. Of these, two were typical, and one ab. *doubledayaria*. In the autumn of the same year I took a number of larvæ off a climbing rose in the garden of the Rectory at Leigh-on-Sea. From these I bred fifteen moths during April and May, 1910, four being typical and eleven ab. *doubledayaria*. Of course, this is a very limited experience, but, as far as it goes, it tends to prove that in the Southend district ab. *doubledayaria* is about as common as the typical form.—Alfred T. Stiff; Leigh-on-Sea, Essex, February 24th, 1911.

Species new to the Gloucestershire List.—I find that I took on June 20th, 1906, amongst the apple trees in my garden, a specimen of *Argyresthia cornella* (*curvella*), and on August 6th following I found *Cataplectica* (*Asychna*) *profugella*—a local and uncommon species—on the Cotswolds. On June 23rd, 1910, *Argyresthia sorbiella* was found resting on a yew tree in the Forest of Dean. *Oxyptilus teucrii* appeared on our hills on July 14th following, at dusk, amongst *Teucrium scorodonium*, and *Ephestia kuhniella* was captured in my house on August 26th and September 21st last. These species do not appear to have been hitherto recorded from this county. I am again indebted to Mr. Meyrick for his kindness in identifying the specimens.—C. Granville Clutterbuck, F.E.S.; Heathside, Heathville Road, Gloucester, February 22nd, 1911.

Wanted: living Vanessa polychloros.—Should any collector capture a female *Vanessa polychloros* this spring and would kindly send it *alive* direct to me, I should be greatly obliged and would make a return. I am particularly anxious to obtain eggs of this species.—F. W. Frohawk; Rayleigh, Essex.

Six Days at Glen Tilt, Perthshire.—It is a long time since I have seen any notes in the 'Entomologist' on the Lepidoptera of the above district, or on collecting therein, so having spent six days there in July last, 19th to 24th inclusive, I thought I would send you a brief note of the species observed:—

Erebia æthiops. Plentiful whenever a gleam of sunshine appeared, occurs over a great extent of the Glen in grassy places.—*Boarmia repandata*. Several on trunks of fir trees, a greyish form and somewhat smaller than the south of England type.—*Larentia cæsiata.* Abundant both in the Glen, and on rocks on the mountains.—*L. ruficinctata.* Two only on one rock, no doubt abundant if one could have found its headquarters, but having taken a good series at Rannoch in August, 1891, on the rocks at the foot of Schiehallion, I did not specially work for it.—*L. didymata.* Common, as usual. I have always found this insect plentiful wherever I have collected in Scotland.—*L. olivata.* A few on rocks in the Glen.—*Dasydia obfuscaria.* On rocks at foot of mountain, not common.—*Emmelesia minorata* (*ericetata*). Plentiful, occurring in the Glen, and also on rocks on the mountains.—*E. adæquata* (*blandiata*). Plentiful on a fence in one place, also beaten from fir trees; this insect was nearly over.—*Coremia munitata.* Plentiful in places at the foot of the mountains. I could not find this species on the rocks, but after a time obtained them by beating the large tufts of heather that grow on and hang over the sides of the burns; the moths conceal themselves under these during the day.—*Coremia designata* (*propugnata*) and *Cidaria populata.* A few of each taken.—*Scoparia murana.* A few amongst rocks and heather.—*Crambus myellus.* Three only. To take this insect was one of the chief objects in my visiting Glen Tilt. I was very pleased to obtain it, and I think the weather was solely the cause of my not meeting with a larger number, but as it rained more or less for five days out of the six I spent in the locality, it was almost impossible to work for *myellus*, the fir trees which they mostly frequent being saturated with moisture to such an extent that a shower bath descended upon you on your attempting to use the beating stick.

The almost total absence of sunshine and the drenched condition of all the herbage and undergrowth made it almost impossible to work for Tortrices or Tineæ, but I was fortunate to meet with *Aphelia argentana* on the day I arrived. The rains set in the next day. I found them plentiful amongst long grass in various places extending some two miles or more up the Glen. *Argentana* is much like *Crambus perlellus* when on the wing, being about the same size and colour, and it also flies amongst grass like the *Crambus*. I passed over several before finally realising what they were, and that I had found one of our most local Tortrices. Other Tortrices noticed were *Aphelia osseana*, just coming out, *Mixodia palustrana*, plentiful during a momentary gleam of sunshine, flying over heather, also one or two *Coccyx ustomaculana*. Amongst the Tineæ were observed *Argyresthia conjugella*, *A. gœdartella*, *A. brochella*, *Œcophora stipella*, *Gelechia galbanella*, *Gracilaria syringella*, *Depressaria pulcherrimella*, and *Brachycrossata cinerella*. I did no night work, the weather making it impossible; I have therefore no record for the Noctuæ. Glen Tilt is a beautiful spot, and the scenery all round it and Blair Athol is superb; this coupled with the delightful and invigorating air of the mountains gives a zest to collecting most enjoyable to one like myself whose entomological work has been necessarily chiefly confined to the southern counties. I hope, however, to be able to make a lengthened visit to the Highlands, including Glen Tilt again, in the coming summer, and can strongly recommend any of your readers who are field workers, and would prefer to take the Highland Lepidoptera themselves, rather than obtain them by purchase or exchange, to do the same. I may perhaps as well say, to mitigate the effect of my observations as to the weather met with in Glen Tilt, that it does not always rain in the Highlands. I have had three holidays there and two out of the three were fine.—G. H. Conquest; 10, Meteor Road, Westcliff-on-Sea.

Optical Instruments.—We have recently received two catalogues from E. Leitz, optical instrument makers, of Wetzlar, London, &c., those dealing with "Photomicrographic Apparatus," and "Projection Apparatus and Drawing Appliances involving the Principle of Projection." These catalogues are two out of nine. The name of Leitz is now, of course, well known as that of a firm of first-class optical instrument makers, and anyone in need of a microscope, projection apparatus, photomicrographic apparatus, or anything connected with such things, should call at 9, Oxford Street, or examine the catalogues. These latter are really more than simply price lists, as they contain excellent illustrations of many of the instruments, and form something of a text-book in connection with them. As regards photomicrographic apparatus (Catalogue 43 G), we like very much the vertical method of working with camera and microscope, and some of the instruments figured seem very compact and convenient. There are at the end of the catalogue two plates of photomicrographs which every photographer seeing them will like to possess, the clearness of detail being particularly fine. Another publication of this firm is a fully illustrated pamphlet of forty-two pages on "The Microscope and Some Hints on How to Use it," which is excellent, though not intended quite for the beginner in microscope-work, with the exception of the general hints at the end. The firm offer the use of electros of illustrations to authors.—W. J. Lucas.

SOCIETIES.

The South London Entomological and Natural History Society.—Annual Meeting, January 26th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Report of the Council was adopted. It was stated that the membership stood at one hundred and sixty-four, and that the average attendance at the twenty-three meetings was thirty-three. The volume of 'Proceedings' published consisted of one hundred and fifty pages, with thirteen plates, and was the most attractive that the Society had produced.—The following is a list of the members elected to fill the offices of the Society for the ensuing year:—President, W. J. Kaye, F.E.S.; Vice-Presidents, A. Sich, F.E.S., and A. E. Tonge, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dods; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.Z.S., F.E.S. (Corres.), and Hy. J. Turner, F.E.S. (Report.); Council, R. Adkin, F.E.S., F. W. Cowham, E. C. Joy, F.E.S., R. A. R. Priske, F.E.S., A. Russell, F.E.S., B. H. Smith, B.A., E. Step, F.L.S. The President then read his Address. After dealing with the affairs of the Society and making suitable references to those who had passed away during the year, particularly to the irreparable loss, not only the Society, but the entomological world, had incurred by the death of a past president, Mr. J. W. Tutt, he proceeded to the subject of his Address, "Neuration in its Bearings on the Classification of Lepidoptera." Votes of thanks were then passed to the retiring Officers and Council.—Mr. Turner, on behalf of Mr. Murray, of St. Anne's-on-Sea, exhibited a series of *Luperina gueneei* taken at the above place, including the typical form, the var. *baxteri*, and two new and very distinct forms, one of them with a very pale, almost white submarginal band, which he was naming var. *murrayi*, and of the other several very dark specimens, which he was naming var. *fusca*. Both worn specimens, and others in almost bred condition, were shown.—Mr. Newman, autumn bred specimens of *Polygonia c-album*, var. *hutchinsoni*, a form of the species hitherto only obtained in the summer brood; they were from the same female as the yellow forms previously exhibited.

February 9th, 1911.—Mr. W. J. Kaye, President, in the chair.—Mr. Wakeley, of Wimbledon Common, was elected a member.—Mr. Newman exhibited shoots of birch, taken from the base of stumps of cut trees, from which the larvæ of *Ægeria culiciformis* had been extracted by birds. It was stated that at times the larvæ bore into the twigs instead of into the stumps.—Mr. Hugh Main, twigs of aspen swollen with galls caused by the larvæ of the Longicorn beetle, *Saperda populnea*.—Mr. Ashby, a series of *Lasioderma serricorne*, which was found swarming in a house in Thames Street.—Mr. W. J. Kaye, on behalf of Mr. Jupp, varieties of *Ennomos angularia*, with the two transverse lines filled in with a dark fascia, *Boarmia repandata* var. *conversaria*, with an unusually heavy black central fascia, and *Triphæna fimbria*, with very strongly contrasted black and white markings on the fore wings.—Capt. Cardew, a number of species which had flown into light in a house on the Island of Dominica, W. Indies, including four Sphingid species—*Pachyla ficus*, *Pholus vitis*, *P. labruscæ*, *Herse cingulata*; also *Deiopeia ornatrix*, *Ecpantheria icasia*, and the Syntomids, *Argadea apta*, and *Cosmosoma demantria*, &c.—The rest of the evening was devoted to the exhibition of microscopic slides by Messrs. West (Ashtead), Fremlin, Edwards, and R. Adkin.—Hy. J. Turner, *Hon. Rep. Secretary*.

City of London Entomological Society.—*January 3rd*, 1911.—Exhibits:—*Abraxas grossulariata* ab.: Mr. G. Brooks, a specimen with usual yellow markings obsolete, but ground colour of all wings deep yellow. *Epinephele ianira* ab.: Mr. C. N. Collenette, all wings bleached and usual fulvous patches and ocelli only faintly indicated; Salcombe, 1908. *Sesia sphegiformis*: Mr. G. H. Conquest, a number of males taken at Brentwood, June, 1895, by assembling with bred females. Melanic *Melitæa aurinia*: Mr. F. B. Cross, example with basal three-fourths of superiors almost entirely black; Cumberland. *Leucania l-album*: Mr. H. M. Edelsten, an imago, bred, 1910. *Argynnis selene*, local variation in size: Mr. A. F. Hemming, comparative series from Princethorpe (Warwick) and Ashdown (Surrey); measurements showed that the largest and smallest male and largest and smallest female from the former district were 8 mm., 3 mm., 7 mm. and 2 mm., wider respectively in wing expanse than corresponding specimens from the latter locality. *Melitæa aurinia*, wide local variation: Dr. G. G. C. Hodgson, a series selected from over one hundred specimens bred, 1910, from Wiltshire larvæ; there was a marked melanic tendency in some cases, while in others the black marginal markings approached obsolescence. Some examples approximated to var. *præclara*, and others showed almost unbroken fulvous coloration. *Trichura cratægi* abs.: Mr. L. W. Newman, dark forms from Selkirk, and pale forms from Lincoln. *Gnophos obscurata:* Mr. L. B. Prout, a variable series, Folkestone, August, 1910; some males nearly white, some females blackish, many with two black lines very pronounced, and a good proportion of the banded ab. *fasciata* (Prout). *Vanessa io* var. *cyanosticta* (Raynor): Mr. V. E. Shaw, three examples of this var. bred August, 1910, from Darenth Wood larvæ; also an asymmetrical *Zygæna filipendulæ* with spots confluent on left wing only; Dover, August, 1910. *Vanessa antiopa:* Mr. P. H. Tautz, a specimen taken at Oakham (Rutland), October 20th, 1910, inside a shop window, by Mr. A. Hassan. Melanic *Cœnobia rufa:* Mr. R. G. Todd, two very dark specimens, said to be not referable to ab. *fusca* and therefore apparently a new variety. *Pieris napi*, female ab.: Mr. H. B. Williams, a specimen with black bar on under side fore wings, faintly indicated on upper side, and connecting up the two black blotches thereon.

January 17th.—Senta maritima vars.: Mr. C. E. Capper, a series from Isle of Wight, including vars. *bipunctata*, *nigro-striata*, *wismaniensis*, and *combinata*. Dianthœcias: Mr. F. B. Cross, a bred series of *D. conspersa*, North Cornwall, including very dark example, almost unicolorous save for pale marginal line. Mr. H. M. Edelsten, a very variable series of *D. carpophaga* bred from Sussex pupæ, the emergence extending from end of May to mid-August; the specimens ranged from strongly marked dark forms to almost white with only the stigmata faintly indicated. *Argynnis paphia* abs.: Mrs. C. Hemming, specimens bred, 1909 and 1910, from New Forest parents, showing exaggeration of black markings; also var. *valezina*, with increase of black markings and general melanic suffusion. *Hesperia linea:* Mr. A. F. Hemming, a series showing two different forms occurring together in a Sussex locality, the one with light ground colour and narrow border, and the other with dark ground colour and broad border. *Tæniocampa pulverulenta* var. *haggertii:* Mr. J. Morris, an example of this somewhat rare ab. taken near Godalming.—SIDNEY J. BELL, *Hon. Secretary.*

RECENT LITERATURE.

The Rhopalocera of Java: Hesperidæ. By M. C. PIEPERS & P. C. T. SNELLEN. With the collaboration of H. FRUHSTORFER. Royal 4to. Pp. i.–xxvi. and 1–60. Plates, 6 coloured. The Hague: Martinus Nijhoff. 1910.

THE Introduction (pp. i–xxvi) is largely biological, the subject of colour-evolution is discussed at some length, and reasons are given for treating the Hesperidæ as "not so far differentiated from the Heterocera as the other Rhopalocera, and therefore in some respects they still stand between these two groups."

The systematic arrangement of the family is pretty much that of Mabille ('Genera Insectorum,' 1903).

So far as is known, ninety-five species of Hesperidæ are found in Java, but upwards of twenty others have been recorded from the island. The latter, however, are considered doubtful, for as we are informed in the Introduction—"not a few butterflies in European collections are said to originate from Java, though in reality they are not from that island, but have been gathered from other islands in the Indian Archipelago and only transported *viâ* Java to Europe."

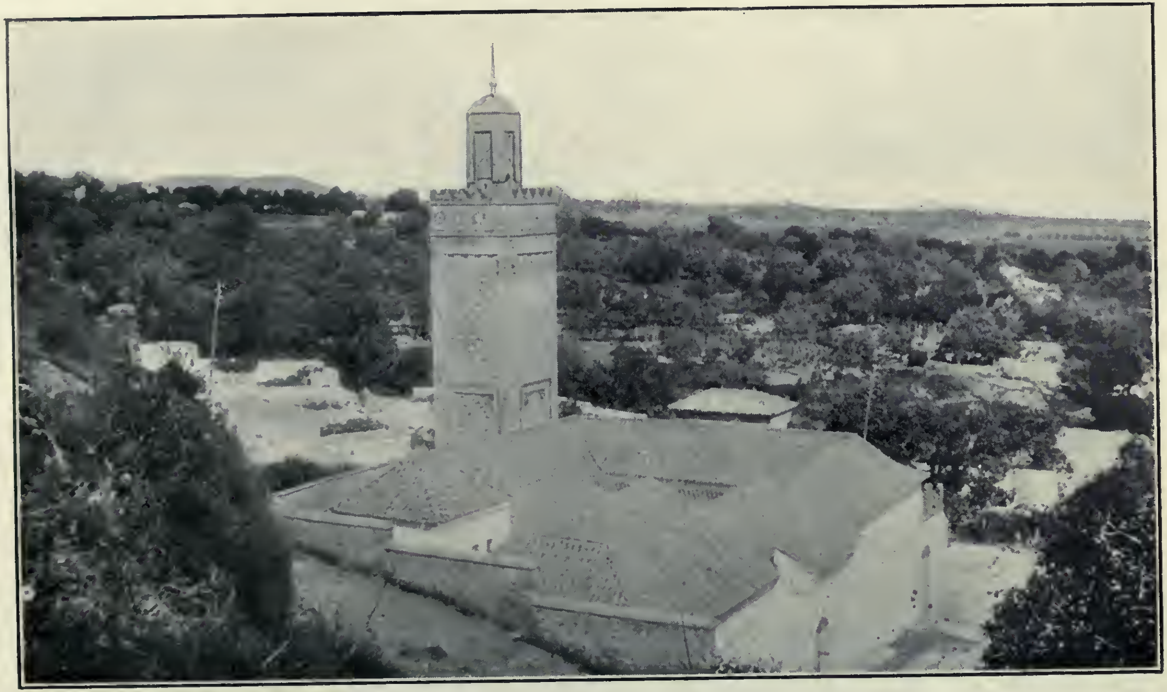
Both sexes are shown in thirty of the seventy-eight species figured, and one or more of the early stages of a good proportion are also depicted in colour. Of eleven other species, the imagines of which are not drawn, there is a figure of the larva of each, and in the case of two of them, the pupa also is shown.

Where known the larvæ are described, and their habits and food-plants noted. The distribution of the species in Java is also indicated. No new species is here described, but several of Moore's species that had been degraded by previous authors have been reinstated. The only local form that is specially mentioned is referred to as follows:—"Among the specimens of the type *Acerbas anthea* described by Hewitson and figured by Distant according to a male from Malacca, the white band does not continue up to the external margin as it does with the Javanese specimens, for which reason the latter can be distinguished as *forma Javanica*."

Diptera Danica. Genera and Species of Flies hitherto found in Denmark. By WILLIAM LUNDBECK. Part iii. Empididæ. Pp. 324. 141 figures in the text. Copenhagen: G. E. C. Gad. London: William Wesley & Son. 1910.

ONE HUNDRED AND SEVENTY species of Danish Empididæ are here described and assigned to five subfamilies in the following sequence:—1. Hybotinæ (3 genera, 9 species). 2. Empidinæ (3 genera, 78 species). 3. Ocydromiinæ (6 genera, 13 species). 4. Hemerodromiinæ (7 genera, 18 species). 5. Tachydromiinæ (8 genera, 52 species). A few other doubtful species are incidentally referred to. *Bicellaria*, Macq. supersedes *Cyrtoma*, Meig. for *nigra*, Meig., *spuria*, Fall., *melæna*, Hal., &c. *Geniculata*, Zett. is referred, as a variety, to *Rhamphomyia plumipes*, Fall. *Ocydromia ruficollis*, Meig. is the female of *Leptopeza flavipes*, Meig., whilst *ruficollis* Macq. is referred to *Ocydromia glabricula*, Fall. *Dolichocephala*, Macq. is adopted for *irrorata*, Fall., and *guttata*, Hal.; *melanocephala*, Fabr. is referred to *Chelipoda*, Macq.; and *vocatoria*, Fall. with *albiseta*, Zett. come under *Phyllodromia* Zett.; *dissimilis*, Fall. is removed from *Tachydromia*, Meig. to *Symballophthalmus*, Beck. Our author is of opinion tl *nervosa*, Loew is specifically identical with *Drapetis aterrima*, Curt . The twenty-nine species of *Empis*, L. are arranged in seven groups or subgenera, thus:—*Xanthempis*, Bezzi (6 sp.), *Anacrostichus*, Bezzi (1 sp.), *Pachymeria*, Stephens (1 sp.), *Lissempis*, Bezzi (1 sp.), *Coptophlebia*, Bezzi (3 sp.), *Pterempis*, Bezzi (11 sp.), *Empis*, S. Str. (6 sp.).

Part i. of 'Diptera Danica' was published in 1907, and Part ii. in 1908.



A. E. G., PHOTO.

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FROM THE WALLS OF TLEMÇEN.

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A NEW SPECIES OF PIMPLINÆ.

By Claude Morley, F.Z.S., F.E.S.

In May, 1908, Mr. G. T. Lyle noticed that many aborted flower-heads of gorse near Brockenhurst, in the New Forest, contained larvæ, and from these he bred the Cecidomyiid, *Aspondylia ulicis*, Trail, together with several Chalcid parasites. During the following September the seeds of the gorse were much galled, and he collected a good many affected pods, breeding from them the same Cecidomyiid and two species of Chalcididæ. On September 20th two Ichneumonids emerged from the galled seed-pods, and some three or four hours after emergence were seen to be *in cop.* During 1909 Mr. Lyle failed in attempts to breed more of this Ichneumonid, but in the autumn of 1910 he was rewarded by the presence of five males and one female of the same species from the pods. He has been so good as to allow me to examine these, and, since they have certainly not been previously brought forward, I propose to call them

Pimpla ulicicida, sp. nov.

Head black, with only the palpi pale; mandibles slender, with teeth of equal length. Antennæ slender, filiform, and hardly longer than half body. Thorax nitidulous, and finely punctate throughout, with notauli short but deeply impressed; mesonotum entirely or broadly at sides and base, mesopleuræ and sternum more or less broadly, and metapleuræ always, with metanotum often, bright red; tegulæ and a circular callosity beneath them stramineous; metanotum longitudinally bicarinate, with no discal areæ, and the petiolar very short; spiracles quite circular and not very small. Scutellum and postscutellum always entirely red. Abdomen linear, strongly punctate and white-pilose, with the tubercles obsolete as in *Scambus*; entirely black above, with the segments longer than broad, and becoming quadrate at fourth in female and sixth in male; basal segment parallel-sided, of male twice and of female but very slightly longer than broad, punctate throughout, male with discally parallel carinæ extending nearly to its apex; terebra exactly as long as abdomen. Anterior legs stramineous, with only the onychii infuscate; front femora not emarginate beneath; hind coxæ and femora fulvous, with apices of former whitish, and the trochanters subinfuscate; hind tibiæ dull white, infuscate at both base and apex, and subincrassate before the former; apical hind tarsal joint at most thrice longer than penultimate; claws of female basally lobate. Areolet small, subsessile, and strongly transverse; stigma pale piceous or luteous; nervellus subgeniculate, though but obsoletely intercepted, a third below its centre. Length, 4–6 mm. ♂, ♀.

The elongate segments and rufescent thorax lend this species much the facies of *Ephialtes*, to which genus I was at first inclined to refer it; it is, however, a true *Pimpla* of the *Epiurus* group, and very distinct among our indigenous species, where it should stand between *P. pomorum*, Ratz., and *P. gallicola*, Morl. I have been at some pains to place it in the palæarctic fauna, and find its closest allies to be the black *P. vesicaria*, Ratz. (Ichn. d. Forst. i. 115), and the pale-faced *P. pictifrons*, Thoms. (Opusc. Ent. viii. 757); but it appears to most closely approach the Mallorcan *P. erythronota*, Kriech. (An. Soc. Espan. Nat. Hist. 1894, p. 248), a larger and stouter insect with the abdomen much less cylindrical.

Mr. Lyle has been so good as to present me with the type of both sexes.

Pimpla has very rarely been raised from Diptera, and I am aware of but two instances of the kind: Rondani once bred in Italy what he called *P. alternans* from *Asphondylia genistæ*, Lw., and I have quoted at some length (Ichn. Brit. iii. 88) Giraud's observations on *P. detrita*, bred from the galls of *Ochtiphila polystigma*, Mg., on *Triticum repens* in Austria.

[With reference to the two species of Chalcididæ mentioned in the foregoing note, M. l'Abbé Kieffer has most kindly identified one as *Eurytoma dentata*; the other is a species of *Pteromalus*. I have not yet been able to clear up the question as to whether they are direct parasites of the Cecidomyid, or hyperparasites through the Ichneumonid. The fact that several of the Eurytomini are known to be either partly or entirely vegetable-feeders must also be taken into consideration.

G. T. Lyle.]

A BIOLOGICAL INQUIRY INTO THE NATURE OF MELANISM IN *AMPHIDASYS BETULARIA*, Linn.

By S. H. Leigh.

Melanism in British moths is a subject that has given rise to much discussion and speculation in several entomological and other journals, but notwithstanding this we really know very little of the causes which operate in the production of melanic forms. It is well known to entomologists that dark varieties of several species of moths have recently become increasingly common in many localities within the British Isles, and also that the dark forms are appearing in fresh localities.

It is very desirable and important to know whether the colour of these dark races of moths is protective, or whether it has some other significance. The "protective" theory certainly appears to be a very feasible one, for many of the moths have become darker in manufacturing districts where the trees and other natural objects upon which they rest have assumed a blackened aspect due to the increase of smoke. On the other hand, I do not think we can press the theory of "protection" too closely at present, for there are many well-known cases in which dark varieties of moths are found in localities far removed from the influence of smoke and where they most probably rest upon light-coloured objects. For example, in North Lancashire (at Silverdale and Grange) the black (*doubledayaria*) form of *Amphidasys betularia* is predominant where formerly it was very rare or absent, and where the atmosphere is as free from smoke and the natural objects (trees, stones, &c.) as clean now as at any previous time. There is probably some other factor than protective coloration at work in the production of this melanic form.

There are also instances in which dark varieties have been developed in moths that rest low down in herbage during the day. In these cases surely the colour could not be of protective value, because the moths are obscured in the grass, and the type of colouring would not matter so far as protection is concerned.

It is of course quite probable that the dark colour of many species of moths is protective, while in others it may be of physiological importance, and associated in some way with constitutional hardiness.

Before, however, any definite explanation of these phenomena can be attempted, it is necessary to have as correct a knowledge as possible of all the conditions which are likely to have any influence on the species known to exhibit this melanic change. Before we can decide whether the colour is protective or otherwise, it is necessary to know the precise nature of the "struggle for existence" of the moths in question.

To gain, however, an adequate knowledge of the circumstances that are likely in any way to affect the moths entails much work of a very laborious nature. I have already commenced such an investigation, and hope to continue it during the next few years.

I only desire now to bring forward one point in connection with my inquiry; this concerns the resting habits of the moths which are subject to this melanic variation. For instance, it is important to know whether the light-coloured moths (*i.e.* the peppered form of *A. betularia*) generally rest during the day on lichen-covered trunks of trees or any other light-coloured object, and also whether the dark insects (as the form *doubledayaria* of *A. betularia*) select black tree-trunks on which to rest. If it can be shown that in the majority of cases the dark-coloured varieties *do* rest upon dark-coloured objects, and lighter varieties upon lighter objects, and also that the insects have many natural enemies, we might justly conclude that the colour has a protective significance. Information of this nature can, however, only be obtained by the co-operation of very many entomologists, for the chance of obtaining sufficient evidence from the observations of one or two persons is very remote. I should, therefore, be extremely grateful if entomologists would assist me in collecting information regarding the resting habits of any of the under-mentioned species belonging to the Geometræ which may have come under their notice.

Although the investigation which I am making is really on the melanism of *A. betularia*, the chances of obtaining sufficient records about the resting-habits of this species alone would be so small that I have included several other well-known melanic species in the list, in the hope that each entomologist may be able to make at least one record about one of the species in the list from his own observations. Particulars, which may be returned according to the subjoined scheme, are requested concerning the following species:—*Amphidasys betularia* (Peppered Moth), *A. prodromaria* (Oak Beauty), *Odontopera bidentata* (Scalloped Hazel), *Phigalia pilosaria* (Pale Brindled Beauty), *Boarmia repandata* (Mottled Beauty), *B. abietaria* (Satin Carpet), *B. rhomboidaria* (Willow Beauty), *Gnophos obscuraria* (Annulet), *Hybernia progemmaria* (Dotted Border).

Scheme of particulars:—

(1) State, if possible, the number of specimens of each variety (light or dark, &c.) of the above species that have been observed at rest, together with particulars as to the object upon which they were found; and also say whether they were conspicuous or well protected by their colour.

(2) State, if possible, whether the species is abundant, fairly common or rare in the locality to which reference of the observation is made.

(3) If it is not possible to answer the above questions, any other information concerning observations of a general character will be very acceptable.

Confirmatory evidence is of great value, and I should be very glad to receive records made independently by different persons for the same locality.

All help received will be fully acknowledged on publication, and I would like here to express (as it has not been possible to publish anything upon the subject) my great indebtedness to those entomologists who have previously sent valuable information concerning the distribution, &c., of the various forms of *A. betularia* in their own particular districts in compliance with a former request.

It is hoped that the result of the investigation—which is partly statistical and partly experimental—may be to throw some light on the cause of the remarkable change in colour that has been observed in many British moths during the last sixty years.

The University, Manchester.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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(Continued from p. 125.)

Ganglbauer remarks that this type seems to be a most extreme modification from the original type, owing to the hook-like connections of the media and radius with their branches. But he points out that in many Nitidulidæ the recurrent branch of the media is very short, and in the Passalidæ and many Rhynchophora completely atrophied, so that, when the transverse veins in the cubito-anal system are at the same time wanting, the venation is very like that of the second type. We need not, therefore, he says, derive the second type from the third. On the contrary, he maintains that the second type is derived directly from the Adephagan type, a point in which Kolbe agrees with him.

It is a point, however, on which Lameere takes a different view, leading to a marked difference in his classification; for he believes that the Staphylinoidean type of wing-venation must have been derived from the Cantharoidean, and not directly from the Adephagan type; that, in consequence, the Staphylinoidea must have branched off from the common Polyphagan stem at a later stage than the Cantharoidea, and should therefore come after them in the classification. But the decision of this question does not rest solely on the wing-venation. Other characters have to be considered; and, in support of their view, Ganglbauer and Kolbe are able to point to the strong resemblance between the primitive Staphylinoidean genus *Pteroloma* and certain Carabidæ, as well as to the great similarity between the larvæ of the two groups. In Lameere's opinion these resemblances are due to convergence. Ganglbauer's view that the third type represents the widest modification from the original type seems to me to be also open to question; for I do not regard the wing-venation of the Cupedidæ as the original type, though doubtless nearer to it than is any other, yet met with in the Coleoptera. It appears to want one longitudinal vein that is frequently to be seen in the cubito-anal system of the Malacoderms and Elateridæ, and while this may not be evident from the figures given by Ganglbauer, I suspect the reason is that he has not quite correctly homologized the veins. The vein A_1 of his Cantharoidean type corresponds, I think, with the Cu_2 and not with the A_1 of his Cupedid wing. Compared as a whole, the cubito-anal system in the Cupedidæ resembles more the same system in the more primitive Polyphaga than it does that of the Adephaga; and the modification undergone by the Cantharoidean type seems to be limited to the loss of a few transverse veins, including one of the two between the media and its branch M_1, the partial atrophy of M_1, and a change from a straight to a curved form in the vein left to connect it with the media. Such a change would be no greater than that which can, I think, be traced in the transverse veins between A_1 and Cu_2, in passing from the straight form they show in the Malacoderms to the more or less strongly curved form, enclosing an elliptical cell, which may be seen in some of the slightly higher groups.

It was never, in my opinion, justifiable to place the Cupedidæ in the Adephaga solely on the ground of their wing-venation. Kolbe, to whom we owe the discovery of the interesting wing-venation of this family, was the first to do so; but he has since, on other grounds, withdrawn them, and now places the Cupedidæ in the Polyphaga. Here, again, I think he is wrong; for, as I have recently pointed out,* the Cupedidæ possess, in common with most of the Adephaga, another character, which seems to be very distinctive of that group—namely, the presence of a distinct suture on each side of the prothorax, between the notum and the pleuræ. This character is to be found in all families of the Adephaga, including the Rhysodidæ and Paussidæ, although it shows in the latter a tendency to disappear in the more modified forms. It is said to occur also in some genera of Polyphaga; but I have, so far, been unable to find anything in the nature of a true suture in any of those genera. Something of the kind may occasionally be seen, as, for example, in the Pythid genus *Crymodes*, but in these cases it is evidently only an impressed line of a secondary character.

A knowledge of the life-history of the Cupedidæ, which is at present wanting, would greatly contribute towards a more settled conclusion in regard to the systematic position of the family. From what little is known of the habits of these beetles, Lameere believes that the larvæ live in wood, and are of the cruciform type; but this remains to be proved. He considers the Cupedidæ to be Adephaga of the most primitive type.

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* Ann. Mag. N. H. (8) v. p. 57 (1910).

The Sexual Organs—Ovaries and Testes.—The *ovaries* of insects consist each of a greater or lesser number of tubes, which taper off to a thread at one end, and at the other open into the oviduct. Each ovarian tube contains eggs or cells that develop into eggs, and it generally contains also other cells which do not develop into eggs, but whose function it is to supply nutriment to the growing egg-cells. According to the presence or not of these nutritive cells, and their position when present, the ovarian tubes offer three different types of structure, placed by Korschelt and Heider in the following order:—(1) Without nutritive chamber. (2) The nutritive cells in chambers which alternate with the egg-chambers (*meroistic ovary*). (3) The nutritive cells massed together in the single terminal chamber (*holoistic ovary*).

The first type is not met with in the Coleoptera. The second occurs in the Coleoptera, but only in those families now comprised in the Adephaga. In all other Coleoptera, so far as is known, the ovaries are of the third type. Emery, who first used this difference in the structure of the ovaries as a basis for dividing the Coleoptera into two suborders, the Adephaga and Polyphaga, considered that the Polyphagan type of ovary was the more primitive of the two. From the order in which the types are placed by Korschelt and Heider, these distinguished embryologists seem to suggest the opposite view—which is also the one accepted by Ganglbauer, Kolbe, and Lameere.

The structure of the testes was investigated by Leon Dufour in a great many different kinds of beetles more than seventy years ago; but his work seems to have received less attention from systematists than the results deserved, although these had been well summarized by Lacordaire in his 'Introduction à l'Entomologie.' These organs (the testes) can, says Lacordaire, be divided at once into (1) those which are simple, and (2) those which are compound. The simple testes consist each of an elongated slender vessel, usually coiled up to resemble a ball; they are found only in the two families "des Carabiques et des Hydrocanthaires," that is to say, in the Adephaga (Fig. 5).

The compound testes are formed of two or several glands—the "capsules spermatiques," or testicular follicles. They are divisible (in beetles) into three sections, according to the form of the follicles and the manner in which these join the *vas deferens*. The first and second sections differ little from one another, and present intermediate stages; the follicles are more or less elongate, tubular, or in the form of rounded, oval or pyriform sacs, but always sessile, *i. e.* without a special duct leading from each follicle. In the first section they are placed at the end of the *vas deferens*, in the second around a more or less considerable portion of its length; they occur in Cleridæ, Heteromera, Coccinellidæ, Hydrophilidæ, Staphylinidæ, and Silphidæ (Fig. 6).

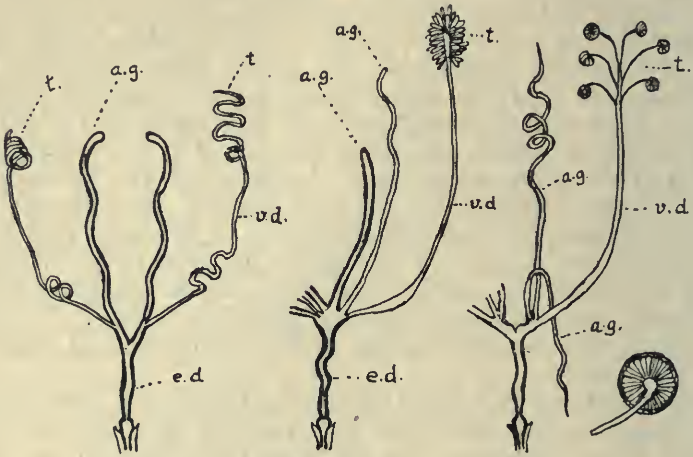

Fig. 5. Fig. 6. Fig. 7.

Three types of male sexual organs in Coleoptera (represented diagrammatically). *t.*, testis; *v. d.*, *vas deferens*; *e. d.*, ejaculatory duct; *a. g.*, accessory gland.

In the third section, the testes are composed of rounded, more or less depressed capsules, having each its own separate duct or pedicel, and abutting, sometimes at the same point, sometimes at different points, upon the *vas deferens*. Testes of this kind, which Lacordaire considered to be those of the most perfect organization, are met with only in the Longicorns, Chrysomelidæ, Rhynchophora, and Lamellicorns.

Dr. Bordas, who has recently carried out similar investigations on a more extended scale, has arrived at practically the same results. He divides the testes into (1) simple and (2) compound; and of the latter he makes two subdivisions, according as the seminal glands are (1) "fasciculées," and (2) "disposées en grappes."

Simple tubular testes, which he considers to be the more primitive type, are characteristic of the Adephaga, and confined to that group. In all other beetles that he examined the testes were compound.

The compound testes of his first subdivision correspond with those of Lacordaire's third section. The glands, from two to twelve in number, of which each organ is composed, are not simple follicles like those of the other subdivision, but consist each of a number of ampullæ arranged radially within a common covering and opening into a central receptacle formed by the dilated end of the duct that leads to the *vas deferens*. Organs of this type, represented diagrammatically in Fig. 7, were met with in all but two of the genera [*] examined belonging to the groups Longicornia, Phytophaga, Rhynchophora, and Lamellicornia, and only in genera belonging to those groups.

The fact that testes of the simple type characterize the Adephaga, while compound testes are found in all other beetles, confirms again the division of the Coleoptera into two suborders. But how are we to interpret the further fact that compound testes of the pedicellate type are characteristic of the Phytophaga, Rhynchophora, and Lamellicornia? Ganglbauer considers this a fact of so much importance as to preclude the idea that those groups have been derived from any other existing groups of Polyphaga. The Rhynchophora probably are, he thinks, derived from the Phytophaga; but the origin of the Phytophaga and Lamellicornia is doubtful, and must be looked for in some ancient Malacoderm-like ancestors, but not in any still existing forms.

Lameere and Kolbe attach less importance to the pedicellate structure of the testes, and seem to think it may be derived independently from the other types met with in the Polyphaga. Lameere would place the origin of the Lamellicornia and Phytophaga near that of the Heteromera and Clavicornia in some Cucuji-form ancestor. Kolbe also looks upon the Phytophaga, Heteromera, and Clavicornia as nearly related groups, and thinks the Phytophaga have been derived from primitive Clavicornia. But he takes a different view with regard to the Lamellicornia. He places this group and the Staphylinoidea together to form the first of the two main divisions into which he subdivides the Polyphaga, including in the same group with the Lamellicornia the family Synteliidæ, through which, he says, they show a relationship with the Staphylinoidea.

His reasons for this course will be discussed further on, when we come to consider the characters derived from the external anatomy.

Not only are there the differences pointed out in the structure of the testes themselves, but differences also in the number, position, and origin of various accessory glands that open either into the *vasa deferentia*, or arise from the common duct to which they lead. Some of these are assumed to be, like the testes and *vasa deferentia*, of mesodermal origin, while others are believed to arise as ectodermal invaginations; and Escherisch has classed them accordingly into *mesadenia* and *ectadenia*. When more general conclusions can be drawn from them, they may play a more important part in the classification. At present, though used by Ganglbauer in characterizing the groups, they seem to be of only doubtful value.

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[*] *Timarcha* and *Melasoma*. Ganglbauer suggests that these exceptions may not be real ones, since a mistake may have arisen from a confusion of names; but I have reason to believe that no mistake has occurred.

(To be continued.)

AN ALGERIAN HOLIDAY.

By A. E. Gibbs, F.E.S.

(Plate VI.)

(Concluded from p. 140.)

Tlemçen is a wonderful and seductive town, with beautiful mosques and surrounded by ancient walls, a place which, once visited, cannot be forgotten, but which inspires a longing to return and linger once more in its ancient streets, or wander among the ruins which are scattered with prodigal profusion over the surrounding country. It is built at the foot of another of the ranges which go to make up the Atlas, the western horizon being bounded by the high mountains of Morocco. From the point of view of the antiquary and historian it ranks among the most interesting cities in the world, but a wholesome fear of the editor's blue pencil deters me from getting too far off the track, and I must get back to the insects. The morning after my arrival, Tuesday, May 31st, found me on the hillside above the town. The tantalising and elusive *pandora* greeted me among the gardens outside the walls. *Pieris brassicæ* and *Rumicia phlæas*, the latter with hind wings rather strongly tailed, fell victims, and then on a bare hillside I caught sight of an insect which I took to be *Melitæa phœbe*, but a closer acquaintance showed that it was something new. A second specimen was taken near by, but these were the only two seen. They proved to be *M. ætherie* var. *algirica*, Stgr., and I take it they belonged to a second generation which was just making its appearance, as they were in the pink of condition and had evidently only just emerged. Allard* records its occurrence at Lambessa in April. The most abundant "blue" was *Polyommatus astrarche*, of the form known as *calida*, a fine variety with a reddish-brown ground colour and strongly developed orange submarginal spots. Miss Fountaine mentions† the capture of this insect at Tlemçen in July, 1904.

Working my way down the hillside again by a steep and narrow path between the gardens, where I took a few each of *P. egeria* and *P. megæra*, I found myself in the Arab cemetery. Striking upwards once more a female of the summer brood of *Papilio podalirius* was discovered sunning itself on the foliage of a young tree, and was the only example to fall to my lot of a species I expected to find rather abundant, but I subsequently saw a second specimen in the forest while travelling by train from Tlemçen to Lallah Maghnia. Continuing the ascent I arrived at the beautiful mosque of Sidi-Bou-Medine, with its graceful minaret and elaborately carved doorway, rich with tile-work and mosaics. Very lovely indeed is this structure, nestling in the greenery of the steep hillside. Attached to it is a médersa, or Arab university, and when I was again at the spot a few days later an Arab gentleman, apparently some one of importance, came out to inspect my net and find out why I was catching butterflies. One thing he wanted to know was whether I ate them! After leaving the mosque I got into someone's garden, and there I took my third specimen of *E. eupheno*. But it was not until the city gates were almost reached that the great event of the day happened. Just outside Tlemçen, in a market garden, was a bank clothed with tall milk-thistles five or six feet high, which were in full flower, and on the blossoms several magnificent *Dryas pandora* were settled, and I thus learned that the way to catch this beautiful creature was to take it while resting on these flowers. Six specimens, one after the other, were caught in this way, and I made a point of visiting this particular bed of thistles whenever possible about noon, and so secured a nice series. After lunch another part of the hillside was explored, but without much satisfaction, *Anthocharis* var. *ausonia* being the most noteworthy butterfly netted. Three more of them were taken the next morning, when I visited the remarkable remains of the old city of Mansoura. Close to the ruined mosque I discovered another big clump of milk-thistles, where *pandora* was disporting itself, and after an uncomfortable hunt among these prickly plants I managed to add three to my series. *Polyommatus* var. *calida* was again in evidence, the only other Lycænid taken being *P. icarus*. On leaving the ruins of the city I climed the hill and traced the course of the ancient conduit, constructed to bring the waters down to fertilise its gardens and fill its fountains, but now used for the more prosaic purpose of driving an oil mill. Descending again nearer Tlemçen I found *fortunata* abundant, but the steep declivity forbade a very prolific chase. The remains of yet another large city are to be seen near Tlemçen. Agadir, whose ruins are scattered over a considerable tract of ground, was built on the site of the Roman Pomaria. Many beautiful koubbas are to be seen in the woods, and the tower of the old mosque is still in a fair state of preservation. But I am wandering into archæology again, and must only say with regard to Agadir that *pandora* haunts its ruins as it does those of Mansoura.

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* 'Annales de la Société Entomologique de France,' 1867, p. 314.

† 'Entomologist,' xxxix. 108.

I was invited by a fellow-countryman whom I met in the hotel at Tlemçen to accompany him to Lallah Maghnia, a fortified post on the Moroccan border, and I gladly joined forces with him for the expedition. Although I believe the place can boast a respectable past, it consists now for the most part of a modern-looking small town, which has sprung up round the military station. During the three days of my visit there was a very cold wind blowing, and the only spots in which insects were to be found were the deep gulleys cut through the fields by the rains of winter. In the shelter of these I discovered two interesting varieties of *Cœnonympha pamphilus*, namely, one specimen of var. *thyrsides* Stgr., which has a row of submarginal black points on the upper side of the hind wing, and two specimens of var. *lyllus*. My other captures were *E. passiphæ* var. *philippina*, *L. icarus*, some Hesperids, and, of course, *P. cardui*, which was everywhere.

On June 4th we drove to the very curious and primitive Berber town of Nedroma, an exceedingly cold ride across the hills. At this place *Satyrus abdelkader* is known to occur, but we were too early for it, and if the date had been right, the weather was wrong. There were occasional gleams of sunshine as we crossed the hills, and during one of these we pulled up and I took the local variety of *passiphæ* and *A.* var. *glauce*. At Nedroma itself the only insects seen were solitary individuals of *P. rapæ* and *P. brassicæ*, which were flying in the garden behind the village shop, which also served the functions of an inn, where we were able to get something to eat. As we left the town I got a glimpse of *pandora*, but not much else was seen on the way home until we reached some hot springs a few kilometres from Lallah Maghnia where *C.* var. *helice* was found. On Sundays a great cattle market is held at Lallah Maghnia, which is well worth visiting, especially by those who are on photography intent, for it is frequented largely by Moroccan dealers, who come with their camels and flocks and herds, and pitch their tents in the market place. They are, however, a very rough and lawless lot, and caution is necessary when using the camera. Another visit was paid on the morning of June 5th to the gulleys in the cornfields when nothing fresh was obtained, though it was not to be wondered at considering the strength of the wind, which hardly permitted the use of the net. This brought my entomological experiences in Algeria to an end, except for the fact that as our boat was moving away from the quay at Oran, our old friend *pandora* flew from the gardens above and circled round us, which we accepted as an omen of a satisfactory journey; nor were we disappointed.

Miss Fountaine's visit to Algeria in 1904, which I have already referred to, extended from January till August, and she explored districts between Biskra in the east and Sebdou in the west. Several of the localities I have written about were included in her itinerary, but she had the advantage of somewhat prolonged collecting in the cedar forest at Teniet-el-Haâd, which I did not visit, and at La Glacière, where I only spent a few sunless hours. Nor was I able to travel in the interesting districts to the east of the capital. She has recorded the occurrence of sixty species of Rhopalocera, as against the twenty-eight which I captured during the fortnight I was in the country. No doubt the weather is largely responsible for my small number of records. To Miss Fountaine's list I can add *Colias edusa* var.

helice, *Pyrameis atalanta*, *Cœnonympha arcanioides*, *C.* var. *thyrsides*, and *Adopæa actæon*.

The following is a list of my captures:—

Carcharodus alcææ, Esp.—Tlemçen, May 31st; Lallah Maghnia, June 3rd.

Hesperia alveus, Hb.—Saida, May 28th.

Adopæa actæon, Rott.—Lallah Maghnia, June 3rd.

A. thaumas, Hufn.—Lallah Maghnia, June 3rd.

Rumicis phlæas, L.—Blidah, May 25th and 26th; Oran, May 30th; Tlemçen, May 31st and June 1st and 2nd.

Cupido lorquinii, H.-S.—Blidah, May 26th; Tlemçen, May 31st.

Polyommatus icarus, Rott.—Tlemçen, May 31st and June 1st; Lallah Maghnia, June 3rd.

P. astrarche var. *calida*, Bellier.—Tlemçen, May 31st, June 1st and 2nd.

Papilio podalirius, L.—Tlemçen, May 31st; between Tlemçen and Lallah Maghnia, June 3rd.

Pieris brassicæ, L.—Tlemçen, May 31st, June 1st and 2nd; Nedroma, June 4th.

P. rapæ, L.—Blidah, May 25th and 26th; Saida, May 28th; Oran, May 30th; Tlemçen, May 31st, June 1st and 2nd; Nedroma, June 4th.

P. napi, L.—Blidah, May 25th.

Anthocharis belia var. *ausonia*, Hb.—Blidah, May 26th; Tlemçen, May 31st and June 1st.

A. belemia var. *glauce*, Hb.—Saida, May 28th; Oran, May 30th; Lallah Maghnia, June 4th.

Euchloë eupheno, L.—Blidah, May 26th; Tlemçen, May 31st.

Colias edusa, F.—Blidah, May 25th and 26th; Hammam R'Irha, May 27th; Oran, May 30th; Tlemçen, May 31st, June 1st and 2nd. Var. *helice*, Hb.—Oran, May 30th; Lallah Maghnia, June 4th.

Gonepteryx cleopatra, L.—Blidah, May 25th.

Dryas pandora, Schiff.—Oran, May 30th and June 6th; Tlemçen, May 31st and June 1st and 2nd; Nedroma, June 4th.

Melitæa ætherie var. *algirica*, Stgr.—Tlemçen, May 31st.

Pyrameis cardui, L.—Blidah, May 25th; Oran, May 30th; Tlemçen, June 1st and 2nd; Lallah Maghnia, June 3rd and 4th.

P. atalanta, L.—Tlemçen, June 1st.

Pararge megæra, L.—Hammam R'Irha, May 27th; Tlemçen, May 30th, June 1st and 2nd; Lallah Maghnia, June 3rd and 4th.

P. egeria, L.—Blidah, May 25th and 26th; Hammam R'Irha, May 27th; Tlemçen, May 31st, June 1st and 2nd; Lallah Maghnia, June 3rd, 4th, and 5th.

Epinephele jurtina var. *fortunata*, Alph.—Hammam R'Irha, May 27th; Saida, May 28th; Oran, May 30th; Tlemçen, May 31st, June 1st and 2nd; Lallah Maghnia, June 3rd, 4th, and 5th.

E. passiphæ var. *philippina*, Aust.—Oran, May 30th; Lallah Maghnia, June 4th and 5th.

Cœnonympha arcanioides, Pier.—Blidah, June 25th and 26th.

C. pamphilus var. *lyllus*, Esp.—Lalla Maghnia, June 3rd. Var. *thyrsides*, Stgr.—Lallah Maghnia, June 3rd.

Melanargia lucasi, Rbr.—Saida, May 28th.

[*Note.*—The undetermined Zygænid mentioned in line 23, p. 138, is *Zygæna hilaris* var. *algira*, Obthr. I have five rather variable specimens, two taken at Blidah and three at Hamman R'Irha. For some interesting notes on the geographical variations of this species, see Monsieur Charles Oberthür's 'Etudes de Lépidpotérologie Comparée,' iv. 599.]

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 152.)

Artona (?) *taiwana*, sp. n.

Head and thorax metallic-blue; abdomen black, segments edged with metallic-blue. Fore wings blue-black, with hyaline streaks between the veins, those on dorsal half longest. Hind wings hyaline; veins blackish, greyer towards the base, margins black.

Expanse, 20 millim.

Collection number, 682.

One example of each sex from Kanshirei (1000 ft.); the male taken in August, and the female in May, 1907. The male specimen is brownish, but as it is much rubbed, the colour of the female, which is in fine condition, is given in the above description; the hyaline markings appear to be alike in both sexes.

Parasiccia punctilinea, sp. n.

♂. Fore wings pale greyish with a slight brown tinge; a black dot at the base, one just beyond, and two on the costa; antemedial line represented by four black dots; a black dot in the cell, and a lunular one at end of the cell; medial line blackish, bent outwards and twice angled below the costa; area beyond medial line and up to the postmedial series of black dots powdered with blackish scales; submarginal line blackish, interrupted, tapered towards the inner margin; marginal dots black. Hind wings rather paler, fuscous tinged. Under side of the fore wings fuscous grey; hind wings paler, with blackish mark at end of cell.

Expanse, ♂ 23 millim., ♀ 28 millim.

Collection number, 677.

One example of each sex from Kanshirei (1000 ft.); the male taken in April, 1908, and the female in April, 1906.

Allied to *P. nocturna*, Hampson.

Norraca curvilinea, sp. n.

♂. Antennæ fasciculate. Head and thorax pale greyish brown, the hinder scales on metathorax tipped with dark brown; abdomen tawny above. Fore wings pale greyish brown, minutely freckled with darker; a blackish dot in the cell and three small ochreous patches below it; an ochreous patch on the inner margin before the tuft of short brown-tipped scales; ante- and postmedial lines dark brown, the former only indicated towards the costa and the inner margin, the latter gently curved from middle of inner margin to apex; fringes dark brown. Hind wings ochreous brown, suffused with darker, a patch of tawny hairs on the abdominal area. Under side pale ochreous brown, the costal area of fore wings clouded with darker.

Expanse, 46 millim.

Collection number, 1679.

One male specimen from Arizan (7300 ft.), June, 1908.

Perciana taiwana, sp. n.

♂. Head and collar brown; thorax and abdomen grey, the latter with brown tufts. Fore wings pale reddish brown, area beyond the postmedial line freckled and clouded with darker brown and blackish grey; all margins slightly freckled with greenish grey; antemedial line blackish, only distinct on the inner margin; postmedial blackish, wavy, inwardly shaded with brown, elbowed opposite end of cell, where, with the black discoidal, it outlines the black reniform stigma; orbicular, minute, black outlined; submarginal line blackish, outwardly edged with whitish, black outward projections towards costa and at middle; inner margin brown between ante- and postmedial lines; a brownish oblique dash towards the base of the wing. Hind wings fuscous, with traces of dusky cell spot and irregular transverse line beyond, the latter black at anal angle.

♀. Fore wings greenish grey, suffused with pale brown on basal three-fifths; mottled with brown and streaked with darker on outer two-fifths.

Expanse, ♂ 30 millim., ♀ 36 millim.

Collection number, 1746.

One example of each sex from Rantaizan (7500 ft.), May, 1909.

Closely allied to *P. marmorea*, Walk.

Polia ornatissima, sp. n.

Head and collar white; thorax blackish, mixed with brown and marked with white; abdomen grey brown, whitish mixed, especially on basal and last segments. Fore wings blackish, costa and inner margin marked with creamy white; white spot at base of the costa, and one near it above the inner margin; orbicular and reniform stigmata, and a spot below, white; three white spots on outer margin, the largest spreading to apex; antemedial line represented by an oblique series of five spots, the first and fifth white, the others ochreous ringed; postmedial line white, macular, curved beyond the reniform; fringes ochreous brown chequered with white; all white markings more or less edged or flecked with ochreous. Hind wings whitish with a black discoidal spot; postmedial line blackish, wavy, not extending to costa or inner margin; marginal line dusky, black between the veins.

Expanse, 48 millim.

Collection number, 1767.

One female specimen from Rantaizan (7500 ft.), May 12th, 1909.

Trilocha brunnea, sp. n.

Head, thorax, and abdomen dark chocolate-brown, crown of head paler. Fore wings dark chocolate-brown, costal and inner marginal areas paler brown; ante- and postmedial lines reddish brown, double, only distinct on the inner marginal area; a bar of the ground colour at end of cell. Hind wings pale reddish brown, inner margin pale brown marked with darker. Under side: fore wings chocolate-brown, veins ochreous tinged; hind wings ochreous brown, clouded with chocolate-brown on the margins; a black dot at end of cell, and two wavy brown transverse lines beyond, the first indistinct except on inner margin.

Expanse, 37 millim.

Collection number, 1792.

One male specimen from Rantaizan (7500 ft.), May, 1909.

The fore wings are considerably rubbed, so that the markings are more or less obliterated.

There is an example of this species, from India, in the British Museum Collection.

BEES FROM THE HIMALAYA MOUNTAINS.

By T. D. A. Cockerell.

In this Journal, Sept. 1910, I gave an account of some bees collected high up in the Himalayas by the British Tibet Expedition. I am indebted to Mr. G. Meade-Waldo for an opportunity to examine other bees from this Expedition, which are now recorded.

Bombus bizonatus, Smith.

♀. Khamba Jong, Sikkim, 15–16,000 ft., July 15th to 30th, 1903.

Bombus waltoni, Cockerell.

Mr. A. Skorikow writes me expressing the opinion that *B. waltoni* is identical with his *B. mendax* subsp. *chinensis*, the latter having about ten months' priority. If so, *waltoni* nevertheless stands, as there is a different *chinensis*, Dalla Torre, 1890. The description of *chinensis*, Skor. is wholly in Russian, but my friend Mr. E. Kaydin has been good enough to translate it for me. It certainly applies well to *waltoni*, except that in *waltoni* the red hair on the abdomen begins on the apical part of the second segment, whereas in *chinensis* the third segment has a sprinkling of reddish hair, and the full red only begins on the fourth. This difference may be only varietal.

Nomada gyangensis, n. sp.

♂. Length 11½ mm., expanse 23; black, yellow, and red; head and thorax black, with abundant dull pale yellowish hair, that on under side white; mesothorax and upper part of head dull, coarsely rugosopunctate; head broad, mandibles simple, malar space distinct; labrum, mandibles (except apex broadly), malar space, clypeus (except upper part) and lateral face marks ending in a point on orbital margin at about level of antennæ, all lemon yellow; antennæ ferruginous beneath, black above; scape rather thick; third antennal joint slightly longer than fourth above, but shorter than it below; upper margin of prothorax, tubercles, stripe bordering each side of mesothorax, large spot on anterior part of pleura, two large spots on scutellum, a small short line on postscutellum, and a spot on each side of metathorax, all yellow, variously suffused or margined with red; scutellum moderately prominent; tegulæ yellow; wings slightly dusky, strongly so at apex; stigma rather small, bright ferruginous; venation ferruginous basally, fuscous apically; b. n. meeting t. m.; first s. m. about as large as the other two united; first r. n. joining second s. m. much beyond middle; legs red, anterior femora with a black stripe beneath, middle with a broader stripe, hind ones nearly all black behind and beneath, but red at apex and base behind; apices of tibiæ and outer sides of basitarsi yellow; abdomen finely and closely punctured, all the segments with broad yellow bands, inclined to be edged with red; basal part of segments black, apical margins brown, yellow band on second segment deeply emarginate in middle; apical plate yellow, densely and coarsely punctured, entire; venter with four broad yellow bands, the fourth emarginate on each side.

Hab. Gyangtse, 13,000 ft., June, 1904 (H. J. Walton). British Museum. This belongs to the subgenus *Holonomada* of Robertson. In the tables of Indian species by Nurse and Bingham it runs to *N. decorata*, but that species has the pubescence whitish and sparse. In Schmiedeknecht's table in 'Apidæ Europææ,' it runs out at twenty-six on p. 46. Superficially, it is not unlike the European *N. sexfasciata*, but it differs in many details.

Anthophora vulpina waltoni, Cockerell.

Both sexes from Gyangtse, 13,000 ft., June, 1904 (H. J. Walton). The male, to my surprise, has the light hair of head and thorax above, and first abdominal segment a warm red. I think it certainly belongs to *waltoni*; a similar dichroism occurs in the American *A. occidentalis*, but is not sexual; further material may prove that it is also independent of sex in *waltoni*. The male *waltoni* has the clypeus lemon yellow, with only marginal black dots, instead of the large black patches of *vulpina*.

Anthophora khambana, Ckll., var. *atramentata*, n. var.

♀. Hair all black, except segments 2 to 4 of abdomen above (excluding sides), where the hair is bright red as in the type; and the white subapical tufts beneath, which are retained. A variety analogous to the variety *schenkii* of *A. parietina*.

Hab. Khamba Jong, Sikkim, 15–16,000 ft., July 15th to 30th, 1903. British Museum.

A NEW APHID-INFESTING *APHELINUS* WHICH IS NOT BLACK.

By A. A. Girault (The University of Illinois).

In October, 1908 ('Entomological News,' Philadelphia, xix. pp. 365–367), Dr. L. O. Howard summed up the existing knowledge of the species of the Eulophid subfamily Aphelininæ known to be parasitic upon aphids, and at the same time described two new forms with the same habit. All of the aphid-infesting Aphelininæ, according to Dr. Howard, are species of the genus *Aphelinus*, Dalman, and all are characterized by having a preponderance of black in their coloration, and by having hairy eyes. That is to say, all are of the general appearance of the first known aphid-infesting species, the common *Aphelinus mali* (Haldeman). It is, therefore, somewhat novel to find a species of this group which is an undoubted aphid parasite, but which is totally yellow in colour, with practically hairless eyes, and which resembles very closely the coccid-infesting *Aphelinus mytilaspidis*, Le Baron. This novel aphid-infesting species differs from *mytilaspidis* in being more intensely yellow, nearly a pale green in colour, the last-named species being about the shade of yellow known as gamboge; structurally, it differs markedly in the quality of the discal ciliation of the fore wing proximad of the oblique hairless line, namely, in having those cilia very much coarser and arranged only in about four lines (a fifth line farther proximad and separated from the others by a naked area), the lines separated, and the cilia at least four times coarser than the dense, moderately fine discal ciliation distad of the hairless line. The oblique hairless line of the fore wing is decidedly broader than is the case with *mytilaspidis*, and another difference is present in the penultimate antennal joint which is shorter, only a fourth of the length of the ultimate joint, or even less, and wider than long. In *mytilaspidis*, the penultimate joint is distinctly longer than wide, and nearly a half of the length of the ultimate or club joint. Taking the foregoing into consideration, this new species need not be confused with any other species of the genus.

Aphelinus automatus, sp. n. (Normal position).

Female.—Length, 0·90 mm. General colour uniformly pallid green, the eyes and ocelli red, the tips of the mandibles fuscous, the venation concolorous with the body and the wings wholly hyaline. Immaculate.

Structurally as in *Aphelinus mytilaspidis*, Le Baron, excepting as mentioned above. Proximad of the oblique hairless line of the fore wing are about from three to four lines of discal cilia which are coarse and at least four times larger than the normal, rather fine discal ciliation of the wing distad of the hairless line. Still farther proximad, separated by a naked area somewhat as in *mytilaspidis*, but much longer (cephalo-caudad), there is another line of about five or six cilia, somewhat smaller. The fore wing, proximad, in this species is broader than in *mytilaspidis*; also the proximal tarsal joint of the caudal legs is shorter and stouter, and the short, sessile stigmal vein is bent more at right angles to the marginal. The mandibles of the two species also differ, in *mytilaspidis* having at least two outer (lateral) teeth which are distinct and acute, and a third inner one which is smaller, weak, and obtusely rounded; in *automatus* there is only a single outer, distinct, acute tooth, and a second inner one which is broadly truncate and separated from the first by a small, acute notch. (From a single specimen, ⅔-inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Unknown.

Described from a single female specimen reared from *Chaitophorus*, new species on poplar, Chicago, Illinois, September 15, 1910 (J. J. Davis). The specimen issued from a single round hole in the dorso-lateral aspect of the abdomen of its host, whose body was black in colour and attached firmly to the leaf surface.

Habitat.—United States—Chicago, Illinois.

Type.—Accession No. *44,229*, Illinois State Laboratory of Natural History, Urbana, Illinois, U.S.A.; one female in xylol-balsam.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

By E. H. Strickland (Dip. S.E.A.C.).

(Continued from p. 134.)

A New Species from South Queensland.

Two female specimens from South Queensland, sent by Dr. Bancroft, both proved to be representatives of a new species of the genus *Culicelsa* (Felt).

The *type* specimen has been forwarded to the British Museum.

Culicelsa queenslandis, n. sp.

Thorax clothed with light yellow and golden yellow scales, arranged in longitudinal bands. Scutellum with pale yellow scales. Abdomen black scaled with incomplete ochreous basal bands, and snowy white lateral spots. Tarsi with snowy white basal bands.

♀. Head very densely scaled. The narrow curved scales are golden yellow and larger and broader on the vertex than on the nape and sides of the head. There is a distinct border of small scales round the eyes. The upright forked scales are golden at the front of the head but black at the back. The lateral flat scales are ochreous. Antennæ with basal and second segments testaceous. Palpi longish with a white median band, and white scales at the apex. Eyes black.

Thorax with light yellow and golden yellow narrow curved scales, arranged in bands. Those forming the median band are light yellow, with a central narrow bare black line, the rest of the thorax being a light warm brown colour. On either side of this band is a golden yellow band. At the side of the thorax is a large central light yellow spot, with golden yellow scales before it and a golden yellow and black scaled area behind. Scutellum rather densely scaled with pale yellow narrow curved scales. Prothoracic lobes with creamy yellow narrow curved scales and golden brown bristles. Pleuræ with creamy flat scales. Abdomen with incomplete basal bands on all segments consisting of a few median ochreous scales and distinct snowy white lateral spots. Ventral surface with ochreous and a few dark scales. Femora dark scaled with a few scattered ochreous scales except for the basal half of the ventral surface which is all pale coloured. Tibiæ dark with a few pale scales arranged more or less in a line, unbanded. Tarsi with distinct white basal bands. Fore and mid legs with two apical joints unbanded. Hind with apical joint only unbanded.

Wings with mid and supernumerary cross-veins in a straight line. Posterior cross-vein about one and a half times its own length distant from the mid cross-vein. First fork cell narrower and longer than the second fork cell. Its stem rather over half the length of the cell.

Length 5·5 mm.

Habitat.—South Queensland.

Time of capture.—June.

Observations.—Described from two rather damaged females.

NEW SPECIES FOUND IN A SMALL COLLECTION OF MOSQUITOES FROM TASMANIA.

This collection was received by Mr. F. V. Theobald from Dr. Bancroft.

It was found that of the seven or possibly eight species represented only one had been already described. This species, *Culex frenchii* (Theobald), which had not been before recorded from Tasmania, was represented by three specimens which were quite true to type. Two other specimens, however, appeared to be either a variation of the type, or a distinct species. They differed mainly in possessing deeper coloured thorax and scutellum, both of which bear golden coloured bristles, whereas the type *Culex frenchii* bears black bristles.

As, however, both specimens were badly rubbed, it was impossible to state whether these represented a new species or not.

The mosquitoes of Tamania appear to have been very much neglected in the past; three species only, all belonging to the genus *Culex*, are recorded in Mr. Theobald's 'Monograph of the Culicidæ of the World,' vol. v. 1910.

These species are *Culex rubithorax* (Macquart); *Culex australis* (Erichson), and *Culex nigrithorax* (Macquart).

The following genera are represented by the new species in this collection:—(1) *Culicada* (Felt), four species. (2) *Stegomyia* (Theo.), one species. (3) *Andersonia* (nov. gen.), one species.

Type specimens of these have been sent to the British Museum.

Culicada tasmaniensis, n. sp.

Thorax black, ornamented with mixed golden and brownish-black narrow curved scales, with a more or less distinct median spot of more creamy scales a little before the scutellum. Abdomen with broad white basal bands on all segments. Legs unbanded, femora mostly pale beneath. Wing membrane with a slight brownish tinge.

♀. Head dark brown in the middle, but lighter laterally with rather large creamy narrow curved scales, which are finer and smaller at the back of the head, where there are a few black upright forked scales. These are replaced in the front of the head by many long black bristles. The median flat scales are creamy and are interspersed with black bristles. Antennæ brown, second segment testaceous at the base. Palpi dark with several black strong bristles. Proboscis brown, darker at the apex than at the base. Prothoracic lobes with a few creamy white broad scales and black bristles.

The thorax is unornamented, except for the pale spot in front of the scutellum, the golden and dark scales being evenly distributed over the remaining area. Bristles are most numerous over the wing roots and round the base of the mesothorax, elsewhere they are practically absent. Scutellum with golden narrow curved scales, and strong posterior border bristles on all lobes. Abdomen dark with broad rather dull white basal bands on all segments, ventral surface mainly white scaled. Wings not very densely scaled, scales rather narrow and brown. First fork cell longer and narrower than second posterior. Supernumerary cross-vein nearer the base of the wing than the mid cross-vein, by about two-thirds of its own length; posterior cross-vein about one and a half times its own length distant from the mid cross-vein. Apices of all femora and tibiæ more or less clothed with ochreous scales. Apex of hind tibia and base of hind metatarsus rather densely clothed ventrally with light coloured scales. Tarsi all dark. (Ungues $\frac{1}{1} + \frac{1}{1} + \frac{1}{1}$.) Halteres with light stems and dark knobs.

Length 6·5–8·5 mm.

♂. Scales on the head similar to those on the head of the female, but fewer bristles are present. The dark scaled palpi are about four-fifths the length of the proboscis. The fourth joint is somewhat shorter than the three preceding joints which are subequal. First joint slender, especially at the base; second joint with apex swollen, and bearing on this part long ventral hairs; third joint cylindrical and entirely clothed ventrally with long hairs, apical joint swollen towards the apex. Antennæ not very densely plumose.

Thorax and abdomen similar to that of the female, except that the ventral surface of the latter is mainly dark with broad basal pale bands, and the dorsal basal bands are more snowy white.

Legs similarly scaled to those of the females. Ungues apparently all uniserrate, though not very clearly defined in the single specimen examined.

Length 6 mm.

Habitat.—Tasmania.

Observations.—Described from two females and one male.

It appears to be related to *Culicada nemorosa* (Meigen), though it is a decidedly larger species.

(To be continued.)

NOTES AND OBSERVATIONS.

The Emergence of a Bornean Cicada (*Huechys sanguinea*, de Geer).—Having just watched a Cicada emerge from its pupa—or nymph—case for the first time, I took some notes of this curious performance which, perhaps, may be of interest to your readers.

The skin and half-emerged imago were brought to me about 11.45 a.m., having been found hanging on the stump of an old tree. Almost immediately the imago crawled out, free of the skin, and I spent an interesting three-quarters of an hour watching its development. The skin of the pupa case is split on the upper side only—longitudinally from anterior margin of the head to the cruciform elevation. The head and body were bright yellow, with two curious little delicate light blue wool-like excrescences on either side; these slowly began to swell —the tegmina first; during this process the basal margin (or "collar," one might call it) of the pronotum was raised; I suppose this was to allow a fluid to run from thorax through the veins to extend the tegmina and wings, as I could see some swollen nervules below this upraised "collar." Similarly the region of the cruciform elevation, and on either side of it, seemed to be connected with the extension of the wings, as that part was also swollen, the general colour being a very light-blue, like that of the basal region of pronotum. By 12 o'clock the tegmina had almost reached the end of abdomen, and in another seven or eight minutes the fully emerged imago was hanging by its fore legs only from the under side of a leaning twig which I had put in the glass cylinder for its use. It thus remained hanging by the fore legs only, both the tarsi and the coxæ of which I noticed were touching the twig. The tegmina were a beautiful blue-white colour; but at 4 p.m. I noticed the veins showed up dark grey, and by next morning this suffusion was further developed: although not yet complete, as the basal region was still streaked in appearance, owing to the grey suffusion not having overspread the internervular spaces. The head, thoracic and abdominal colouring had already deepened, thus losing its original bright yellow hue.

The nymph case has rather coarse and thick antennæ sheaths, prominent excrescences for the eyes and ocelli; the pronotal folds are distinct, the base of pronotum is coloured deep black, as are the posterior margins of mesonotum and of each abdominal segment on the upper side; the general colour being of light sand relieved by these transverse black stripes. The fore legs are typically fossorial, with stout femora each armed with a spine.

Borneo is particularly rich in species of Cicadidæ, no fewer than seventy odd species having been recorded. Among these is the gigantic *Pomponia imperatoria*, Westwood, which sometimes measures as much as eight and a half inches! The males are much attracted by light, and many good species have been captured at lighthouses in Sarawak, including two species new to science.—J. C. MOULTON; Sarawak Museum, February, 1911.

HYBERNATION OF PYRAMEIS ATALANTA.—I have read with interest the article by Mr. L. W. Newman in your issue of March, 1911 (*antea*, p. 99). While admiring his experiments, I would like to point out that they do not bear out his conclusion: that *P. atalanta* is not a true hybernator, as it requires food all the year. Mr. Newman is in effect arguing that, because *atalanta* kept through the winter in a warm room required food, they would therefore require food if hybernated out of doors in the cold, where they would not be artificially stimulated into activity. This, of course, does not follow. That England should have to depend on alien immigration for its yearly supply of *atalanta*, a fairly common butterfly here, is hardly conceivable. This theory also breaks down on Mr. Newman's own reasoning. Where are the supposed parents of the English *atalanta* to come from? France? If so, it must be the South of France, for the North of France conditions are similar to the English, and, were not *atalanta* a true hybernator, it would be unable to get its winter food in North France any better than in England. South France is a long way to come from. On the Riviera *atalanta*, in shabby condition, are to be met with practically throughout the winter. There, of course, they can find sufficient flowers all the year round to supply their modest needs. *V. antiopa*, on the other hand, I do not remember ever to have seen during the winter, although the finer weather of spring lures out hybernating specimens with the white borders, commonly supposed over here to prove British origin.—J. C. WARBURG; 21, Pembridge Gardens, W.

TROCHILIUM APIFORME.—With reference to Mr. J. S. Carter's note on this species in the April issue of the 'Entomologist,' I would enquire whether the larvæ found in April, but as I understand without cocoons, in the pupating tunnels duly spun up? If so, this would prove that they were full fed, and would show that the time over which they form their cocoons extends from September or October till, at any rate, the spring. I have found that all the uninjured larvæ that I obtained in the autumn duly spun up, and several times where the top has been accidentally cut off a puparium in removing it the larva completed the cocoon. But two or three larvæ that I found in June, and which looked to be full fed, failed to spin up, and eventually died. I concluded that these were not really full fed, but would in the ordinary course have spun up in September or October. As regards treatment, I cannot help Mr. Carter, my luck having been no better than his. I believe I kept mine too moist, but it is difficult to hit off the *via media* between over-moistening, and thus producing mould, and keeping too dry, in which case the cocoon contracts and crushes the larva or pupa inside. I can breed to the imago ninety per cent. of full fed larvæ and pupæ of *Sesia vespiformis*, but *T. apiforme* defeats me, as I get only a small percentage to the imago stage.—C. G. Nurse; Timworth Hall, Bury St. Edmunds, April 9th, 1911.

Plusia moneta.—Very few reports of this species seem to have been published recently, but, although the novelty of its appearance in this country has, no doubt, worn off, it seems a pity that reports of actual captures in more and more distant localities from its original place of landing (Kent) are not published. So far as I can trace, the extent of its spread from that county is indicated by reports from Monmouth (Ent. xxxvii. 214), Cheshire (Ent. xxxix. 291), and North Lincolnshire (Ent. xlii. 236). Has it not been found further north or west yet? And has it been taken in Wales, Scotland, Ireland, or the Isle of Man? I, for one, should be glad of the earliest records for these countries and for subsequent ones showing how the insect spreads, and I think it would be as well if these reports appeared in the 'Entomologist,' so that they would be permanently on record for future use.—C. Nicholson; 35, The Avenue, Hale End, Chingford, April 3rd, 1911.

Pyrameis atalanta and Vanessa io in Middlesex in 1910.—In a recent note Mr. L. W. Newman (*antea*, p. 99) remarks on the general scarcity of *P. atalanta* last autumn. In the London parks, however, this butterfly was by no means uncommon; and on a sunny Sunday at the beginning of October I noticed several fine examples on the flower beds on the north side of Hyde Park. In Middlesex hereabouts *atalanta* was late, but not markedly scarce; *Vanessa io* also turning up in some force—a rather remarkable fact, in view of the wretched, sunless summer and the almost total absence of the species from the district for so many previous years. Early in March of this year single hybernators of the latter butterfly were flying during the brief spell of warmth which preceded the severe storms and cold of early April; and latterly I have seen quite a number of [females about, in excellent condition, giving promise of a plentiful summer emergence, both here and on the southern approaches of the Chiltern Hills from Great Missenden.—H. Rowland-Brown; Oxhey Grove, Harrow-Weald, April 24th, 1911.

Senta maritima. — I would like to record having taken var. *combinata* (Capper) of this species in the Isle of Wight last August; it is the second taken by me in the same locality, the other one being captured in August, 1909. The specimen just recorded is in the possession of Mr. Percy Bright, of Bournemouth.—Charles Capper; "Glyndale," Glebe Road, Barnes, S.W.

Vanessa antiopa in England.—If a very hazy note may be permitted on Mr. Frohawk's remarks on p. 155, I remember reading in some book or periodical many years ago a statement by H. T. Stainton that, being in Scotland, he observed a larva of *V. antiopa* feeding wild on willow, and that he left it *in situ*,* fearing that he would not be able to rear it. Perhaps this vague recollection may enable someone to turn up the reference and so supply the needed "authentic instance."—Rev. W. Claxton; Navestock Vicarage, Romford.

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* E. M. M. vii. 109.—Ed.

The Tapping of Anobium tessellatum.—Judging from the notes on this subject by Mr. Gahan and Mr. Claude Morley in vol. xliii., some record by an eye- and ear-witness may be acceptable. Some years ago it was found necessary to replace a beam in the library of Cambridge University. When the old timber was taken out, it was found to be dreadfully riddled by *Anobium tessellatum* (now called *Xestobium rufovillosum*), and a lump of it was brought to me with several of the beetles, as well as its attendant *Corynetes*. The wood was placed with the beetles in a large glass receptacle on my writing-table, and for some days I had frequent opportunities of seeing and hearing the performance of the beetle. I regret very much that I took no notes, and can therefore only speak from memory. The beetle rests very quietly on the wood; the head is down below, on account of the peculiar formation of the thorax. The creature at intervals becomes restless, and, raising the front part of the body from the wood, rapidly lowers it, thus striking the wood with the front surface of the head. After several taps it becomes quiet again. My impression as to the number of strokes is that they were usually from three to six in number. I did not find that any impression was produced on its fellows by the performance, and if asked I should say that it is merely a restless habit. It will probably be easy to procure specimens of the beetle in the early summer in places where there are old large buildings; so that we may hope that someone will soon give us a better account than my recollection permits me to do. I would strongly advise that some of the wood it may be found in be placed with the beetle. Indeed, it should be kept in as natural a condition as possible, and the specimens should not be crowded.—D. Sharp; Lawnside, Brockenhurst, April 12th, 1911.

Odynerus callosus.—A few days ago a friend living in Stroud, Gloucestershire, sent me an insect which he met with basking in the sun on a stone wall not far from his residence on February 15th last. The insect was *Odynerus* (subgen. *Ancistrocerus*) *callosus*, Thom., a very common species here in the summer and autumn. It must have been a hybernated specimen. Can your readers inform me if they have ever met with this insect so early in the season? The date I consider worth recording.—V. R. Perkins; Wootton-under-Edge, April 17th, 1911.

The Tutt Collection.—We all knew Tutt. Not only in this country but on the Continent of Europe also, and possibly far beyond, his name was to the entomologist a household word. His 'British Noctuæ and their Varieties' has for many years been a well-studied book; why, then, was so little interest manifested by those assembled at Stevens's Sale Rooms on April 11th, when the material that he had collected during the best years of his life, and on which this book was largely based, was offered at auction? A satisfactory answer is difficult to find, but the fact remains that many lots which contained the actual specimens on which his varietal names were founded brought no more than, if as much, as would an equal number of specimens from any ordinary collection. Thus, for example, a lot of 105 specimens, including *Bryophila perla* vars. *distincta* and *flave-*

scens, sold for 9/–, and one of 95, in which was included var. *suffusa* and others, 6/–; another lot of 115 specimens, containing among them *Leucania lithargyria* var. *pallida*, and many vars. of *L. impura*, brought only 3/–; while some 132 specimens, among which were included *Xylophasia rurea* vars. *nigrorubida*, *ochrea*, *flavo-rufa*, *intermedia*, and many others, sold for 4/–. Even the carefully worked-out series of *Agrotis tritici*, &c., failed to raise any enthusiasm, and after the first two lots offered fetching 7/– and 9/– respectively, prices dwindled again to the 4/– and 5/– level, and the climax was reached when the last five lots of the Noctuæ offered had to be lumped together to find a buyer at 3/– for 513 specimens of *Anchocelis*, &c., although simply bristling with named forms. Such a state of things gives pause for reflection; possibly the specimens were not all in the finest possible condition, but even, then, have they not some historic value?

Some other portions of the collection fared better. Four lots of four each of *Drepana sicula* (*harpagula*) brought from 30/– to 37/6 per lot, one of three 25/–, while others in perhaps not quite such good order, and sold in lots with other species, realized somewhat lower prices. A pair of *Gluphisia crenata*, to which the only datum was "Bucks," sold, with some 60 other specimens, for 10/–; *Notodonta trilophus* (Berwickshire, 1878), with others, 18/–; *Bryophila algæ* (Hastings, 1873), in a lot of 57 specimens, 8/–; and a very pale form of *Acronycta auricoma*, which, by the way, did not appear to have any special varietal name attached to it, sold, with eight others and five *A. myricæ*, for 24/–. Two lots of *Acronycta strigosa* of eleven each, of which six were bred from ova, realized 26/– per lot; a specimen of *Tapinostola extrema* (Isle of Wight, Sept. 1889), with some eighty other specimens, 21/–, and three lots of *Apamea connexa* (Rotherham and Barnsley, 1881–7), sold in lots of twelve for 32/6, twelve for 28/–, and nine for 24/–; while a lot of twenty *Agrotis obscura* (*ravida*), nine *A. simulans* (*pyrophila*), and sixteen others, brought 16/–, and three passable specimens of *Noctua subrosea* realized just 30/–.

Among the Continental Erebias offered at the same time, a dozen specimens of *Erebia palarica*, Chapman, put up in lots of three each, realized from 16/– to 20/– per lot, but none of the other species appeared to attract any great amount of attention—indeed, it was found impossible to place some of the lots offered. We understand that a further portion of the collection will be offered in the autumn, when it is to be hoped a greater amount of interest may be exhibited.—R. A.

The well-known collection of British Lepidoptera formed by Mr. S. J. Capper, of Liverpool, has been privately purchased and been placed with Mr. Newman, of Bexley, for disposal. The collection is rich in varieties, and contains most of the "extinct species"; some few of the aberrations have already found their way into other collections, but there are still many interesting forms awaiting a new home.—R. A.

Surrey Orthoptera.—Mr. J. G. Dalgliesh, of Midhurst, sends me the following addition to my list (*antea*, p. 51). Unless otherwise stated, all were taken by himself:—*Labia minor.*—Witley, fairly common. *Forficula lesneri.*—Witley, two specimens, 1909. *Ectobius panzeri.*—One specimen taken whilst sweeping at Thursley in 1907. *Gryllus campestris.*—A colony between Eashing and Godalming, whence he received specimens. *G. domesticus.*—Several specimens received from a bakehouse in Haslemere in 1908. *Gryllotalpa gryllotalpa.*—Another specimen from Churt in 1908. *Leptophyes punctatissima.*—Witley, 1909. *Meconema thalassina.* Witley, 1909. *Phasgonura viridissima.*—Two specimens in 1908, near Thursley, on a sunny hedge-bank among nettles (J. G. D.). Specimens near Godalming (O. H. Latter). *Metrioptera brachyptera.*—Witley, 1909. *Conocephalus dorsalis.*—One near Witley, 1910. — W. J. Lucas; Kingston-on-Thames.

Lepidoptera at Sallows at Windermere.—On the mild nights following the March east wind, sallows were very productive at Windermere. I visited a large sallow-bush on the evening of April 1st, on which the Tæniocampæ literally swarmed. Of *munda*, scarcely two were alike, and some varieties were very extreme. Good varieties of *opima* and *incerta* were present, and *cruda*, *gothica*, *populeti*, and *rubricosa* fell in showers. The best captures, however, were *Calocampa exoleta* and *T. leucographa*. *Exoleta* is a rare insect at Windermere, and this pilgrim, a perfect specimen, was made very welcome. *Leucographa*, although resident in the district, has not been seen of late. The captured specimen was a male. Street-lamps, on March 29th, were very prolific. *Amphidasys prodromaria* seemed more than usually common, and I saw some exceptionally light and dark specimens. *Anticlea badiata* and *Polyploca flavicornis* were quite fresh, but *Hybernia marginaria* and *Anisopteryx æscularia* were very worn.—Helena Brockbank; 22, Holly Terrace, Windermere, April 3rd, 1911.

The Entomological Club.—Two meetings of this Club were held during March last: one on the 21st, at "Wellfield," Lingards Road, Lewisham, the residence of Mr. Robert Adkin; the other, on the 24th, at 58, Kensington Mansions, South Kensington, the residence of Mr. Horace Donisthorpe.

Errata.—Page 147, line 9, for "*egeria*" read "*megæra*"; line 13, for "*megæra*" read "*egeria*."

SOCIETIES.

Entomological Society of London.—*Wednesday, March 1st*, 1911.—Mr. G. T. Bethune-Baker in the chair.—Messrs. Lionel Armstrong, Government Entomologist to the Gold Coast, Gold Coast, West Africa; J. Platt Barrett, 30, Endwell Road, New Cross, S.E.; the Rev. Henry William Brutzer, B.A., Great Bowden Vicarage, Market Harborough; Messrs. P. P. Graves, Club de Constantinople, Constantinople; Thien Cheng Kung, Guardian Superintendent of Chinese Students in British India, care of the Curator, Mysore Government Museum, Bangalore, India; the Rev. A. Miles Moss, Helm, Windermere; and Dr. Cuthbert F. Selous, M.D., M.R.C.S., L.R.C.P., Agra, Barton-on-Sea, New Milton, Hants, were elected Fellows of the Society.—Dr. Nicholson showed six specimens of *Choleva fuliginosa*, Er., an addition to the list of British beetles, from Alphington, Devon. This species closely resembles *C. nigrita*, Er., with which it is mixed in several collections, and is probably widely distributed in this country. Mr. Dollman has taken it at Harrow, Mr. Donisthorpe at Hartlepool, Mr. Taylor in the Isle of Wight, and it is also in the Bates collection.—Mr. L. W. Newman exhibited some sticks (the off-shoots of birch-stumps) containing larvæ of *Ægeria culiciformis*; also sticks of *Salix capræa* containing larvæ of *Trochilium bembeciformis*, one of these showing the cap formed over the hole prepared for emergence. This species is not usually supposed to form a cap. The larvæ were not, as is generally thought, confined to living wood, some of those exhibited being in dead twigs. Also a living specimen of *A. culiciformis*, a species which the exhibitor remarked was easily forced.—Mr. G. T. Bethune-Baker showed a specimen of *Erebia ceto* which had been swept from the herbage without its head, which was probably held fast by a spider; nine hours after capture this insect had still been capable of fluttering strongly. He also exhibited a specimen of *Erebia* var. *adyte*, with a half-developed right hind wing; a specimen of *E. eriphyle* with no left hind wing, and a *Melitæa varia* with no right hind wing; in the two latter there was no trace of the wing having ever been developed. —Mr. A. Bacot communicated a note confirming the Hon. N. C. Rothschild's distinction between *Ctenocephalus canis* and *C. felis*, both of which he had bred from ova. He gave measurements showing the difference in size and shape between the eggs of the two species, comparing them also with those of *C. fasciatus* and *Pulex irritans*. He also read a paper entitled "On the Persistence of Bacilli in the Gut of an Insect during Metamorphosis," commenting on which Dr. Chapman observed that, in moulting (referring chiefly to Lepidoptera), a provision for increase of size is not the only object in view, but also the removal of various possible microbic enemies. In "laying up" for a moult a larva almost invariably first empties the alimentary canal; at the actual moult, not only the skin but the lining membranes of the tracheæ and of much of the alimentary canal are cast also. The threads drawn from the mouth and anus, consisting of the linings of the *primæ viæ*, often seem long enough to represent the whole tube; if this be so, then bacillary inhabitants would be got rid of, and in any case must be so to a great extent. It would be interesting to know what is the precise hiatus between the oral and anal portions, and what provision there is for establishing an aseptic condition of this portion of the tube.—Messrs. Ernest A. Elliott and Claude Morley communicated "A first Supplementary Paper on the Hymenopterous Parasites of Coleoptera."—The Secretary read to the Society a letter of condolence received by Dr. Chapman from M. Charles Oberthür, one of the Honorary Fellows, containing an appreciation of the late Mr. J. W. Tutt.

Wednesday, March 15th, Special Meeting.—Rev. George Wheeler, Secretary, in the chair.—The letter summoning the Special Meeting was read by the chairman, and, no other candidate having been proposed, the Rev. F. D. Morice, M.A., was declared to have been elected President for the current year. The ordinary meeting followed immediately, the Rev. F. D. Morice, President, in the chair. The President addressed a few words to the Society, thanking them for their choice of him for the post, and expressing regret for the circumstances which had made an election necessary.—Messrs. George Moffatt Carson, Entomologist to the Government of New Guinea, Port Moresby, New Guinea; Alfred George Scorer, Hill Crest, Chilworth, Guildford; Percy William Affleck Scott, Chinese Imperial Customs Service, Hangchow, China; Noel Stanton Sennett, 32, Bolton Gardens, South Kensington, S.W.; James A. Simes, 2, The Byre, Whitehall Road, Woodford, Essex; P. H. Tautz, Cranleigh, Nower Hill, Pinner, Middlesex; R. G. Todd, The Limes, Hadley Green, N.; R. Vitalis, Commis de 1re classe, Trésor, Pnom-Penk, Cambodia, French Indo-China; and Rev. W. G. Wittingham, Knighton Rectory, Leicester, were elected Fellows of the Society.—The President announced that he had appointed Dr. F. A. Dixey, M.A., M.D., F.R.S., and Messrs. G. T. Bethune-Baker, F.L.S., F.Z.S., and H. St. J. Donisthorpe, F.Z.S., to act as Vice-Presidents for the current year.—Mr. H. St. J. Donisthorpe exhibited a nest of *Lasius umbratus*, Nyl., which had accepted a ♀ *L. fuliginosus*. On December 13th a deälated ♀ *L. fuliginosus* was put into a small plaster nest with a dozen of the *umbratus* ☿ ☿; she was slightly attacked, but not in any way injured, and tried to conciliate the ☿ ☿ by stroking them with her antennæ; she protected her waist by crossing the back legs over it, and her neck by pressing the head back against the thorax. By December 21st she was accepted by the whole nest, and has been treated as their queen ever since. Only one or two ☿ ☿ occasionally threatened her with their jaws, though the first *fuliginosus* ♀ placed in the nest was killed. The ☿ ☿ killed most of their own virgin ♀ ♀. —Mr. W. C. Crawley also exhibited a case containing a colony of *Lasius umbratus* with a *L. fuliginosus* ♀ as queen, and a colony of *L. niger* with a *L. umbratus* queen. He mentioned that deälated ♀ ♀ do not always behave as if fertilized, the ♀ in this nest being restless as the winged ♀ ♀ are before the marriage flight.—Dr. Chapman began a discussion as to whether this form of "parasitism" was in the long run profitable to the parasitised species, by weeding out the weaker nests; the President, Mr. Verrall, and Mr. G. A. K. Marshall also joined in the discussion.—Mr. F. Merrifield exhibited 134 specimens of *Selenia bilunaria*, and read a short paper on the question whether temperature in the pupal stage may affect the size of the imago in some Heterocera. His experiments showed that in every case the imagines from the cooled pupæ are, on the average, larger than those from the forced, the difference ranging in the males from 1·3 to 20·8 per cent. (averaging 13·6 or 13·9), in the females from 0·7 to 9·5 per cent. (averaging 3·3 or 3·6). It seemed to him that the difference was too great and too diffused, embracing as it does each sex in five separate families, to be explained in any other way than this: that it is caused by something that, in consequence of the difference in temperature, happened to either those forced or those cooled, or both of them, in the pupal stage.—Mr. H. Main exhibited a stereoscopic photograph of the cocoon of *Chrysopa flava*, opened to show the hybernating larva, and of the larva taken out of the cocoon to show how it lies coiled up with its tail over its head.—Mr. O. E. Janson exhibited larvæ and cases of a Psychid from Amboyna, the cases being beautifully constructed and closely covered on the exterior with small spines, intermixed with larger spines or thorns. The largest of the cases measured nine inches in length.—Dr. Chapman read a paper on "The British and a few Continental Species of the Genus *Scoparia*," and showed photographs of the genitalia and a drawing to illustrate the neuration.—The Secretary announced that the Conversazione was fixed for Wednesday, May 17th, and that the Linnean Society had kindly placed their Rooms at the disposal of the Society for that occasion, and were generously lending their lantern, making no charge for light or for the current for the lantern. He also announced that Professor Poulton and Mr. Enock had consented to give lectures on that occasion. As the arrangements with the Linnean Society preclude the sale of tickets, it will be necessary to ask for a subscription towards the expenses (for refreshments, printing, postage, &c.) from those who apply for them, and also strictly to limit the number for which each Fellow may apply. On the motion of Mr. Rowland-Brown, seconded by the Rev. G. Wheeler, a vote of thanks was unanimously passed to the President and Council of the Linnean Society for their kindness and generosity.—George Wheeler, *Hon. Secretary.*

The South London Entomological and Natural History Society.—*February* 23*rd*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. J. H. Leslie, F.E.S., of Tooting, was elected a member.—Mr. Turner exhibited three Noctuids sent to him by Mr. Murray, of St. Anne's-on-Sea; two of the specimens were very dark melanic forms of Agrotids, superficially very similar, but which on close examination he considered to belong to two species, *Agrotis tritici* of the var. *nigra* form, and *A. nigricans* of the var. *fumosa* Fab. (nec God.). The third specimen was a worn *Luperina*, possibly referable to *L. cæspitis*, the small, grey, rough surfaced form sometimes met with on the coasts of Lancashire and Sussex.—Mr. Moore, the very beautiful leaf-moth of India, *Gloriana* (*Phyllode*) *ornata*.—Mr. Newman, (1) sticks, both living and dead, of sallow containing larvæ of *Trochilium bembeciformis*, and also some containing the similarly feeding larvæ of the musk-beetle, *Aromia moschata*; (2) a living specimen of *Ægeria culiciformis*, bred after sixteen days' forcing; and (3) full fed larvæ of *Arctia caia* and *Callimorpha dominula*, which had been forced on; he stated that some larvæ of the former species had made no response to the treatment.—Mr. Kaye, a varied series of *Spilosoma lubricipeda* and its var. *zatima*, and asked if it had been obtained by anyone recently.—Mr. Adkin, melanic examples of *A. nigricans* to compare with Mr. Murray's specimens.—M. Tonge showed a series of lantern slides, each illustrating the complete life-history of a British butterfly.—Mr. Edwards, a set of slides illustrating the anatomy of a lepidopteron.—Mr. Main, slides sent by Mr. Hancock, of Birmingham, illustrating the structure, habits, and snares of spiders.

March 9*th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. A. E. Gibbs exhibited a collection of Lepidoptera from the Cuna-

Cuna Pass, Blue Mountains, Jamaica, including the rare *Papilio homerus*, and fine local forms of *Aganisthos odius*, *Gynæcia dirce*, *Hymenitis diaphanus*, *Calisto zangis*, *Adelpha abyla*, &c.—Mr. Adkin, a form of *Nola albulalis*, in which the dark brown band was reduced to a dark narrow stripe only, giving a much more delicate appearance to the insect.—Mr. W. J. Kaye, several Syntomid species of the genus *Pseudosphex* and the wasp models which they so closely mimicked in build, shape of antennæ, legs, colour, &c.—Mr. Sheldon, the two specimens of a Noctuid, about which much discussion as to their identity arose many years ago, &c., which were named *Agrotis helvetina*. They are now regarded as pale, putty coloured examples of *Graphiphora augur*.—Mr. Blenkarn, a pale xanthic form of *Epinephele tithonus*, from the Isle of Wight, and a fine dark clouded example of *Camptogramma bilineata* from the same place.

March 23*rd*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Stanley A. Blenkarn, of Beckenham, was elected a member.—Mr. W. J. Kaye exhibited a series of *Xylina conformis*, all but one from Glamorganshire, and remarked on its occurrence and distribution.—Mr. Newman called attention to the devastation caused by some hitherto unknown disease among bees in the South of England. It was most contagious, and scarcely a hive remained over a large area. —Mr. Buckstone, a bred series of *Apocheima* (*Nyssia*) *hispidaria*, and gave particulars as to breeding. He also contributed notes on the occurrence of numerous dwarf examples of *Hybernia defoliaria* at Richmond; the pairing of *H. marginaria* male and *H. defoliaria* female; delayed wing development of *Chesias rufata*; pupation of *Triphæna pronuba* after hybernation without feeding; the finding of the ova of *Spilosoma menthastri* on the shell of a living snail; and the occurrence of batches of ova of *Hadena pisi* on a small plum-tree. Mr. Newman said that *A. hispidaria* readily pupated in two inches of soil if the bottom of the cage was the concrete floor.—Mr. R. Adkin, two varieties of *Arctia caja*, from Yorkshire larvæ. One with whole of fore wings dull smoky brown with very much diminished white markings, the hind wings black with only a few dull yellow, some ill-defined, patches; the other with a concentration of the lighter colour of the fore wing towards the base, and of the darker colour towards the apex, while the hind wings were bright orange-red with much reduced black markings. He also showed living *A. zonaria* with eggs *in sitû* under bark of clematis.—Hy. J. Turner, *Hon. Rep. Secretary*.

Lancashire and Cheshire Entomological Society.—Meeting held *February* 20*th*, 1911, at the Royal Institution, Colquit Street, Liverpool, Mr. Geo. Arnold, M.Sc., F.E.S., Vice-President, in the chair. The Vice-President delivered a lecture on "Ants," in which he dealt chiefly with the recent discoveries connected with the habits of the subterranean fungus-eating species and the curious procedure of the females when founding a new colony. The ants which infest trees, constructing their nests in hollow parts of the branches, were also specially dealt with, and the economic effect of their presence described. The lecture was illustrated by a large number of specimens, and also by means of drawings on the blackboard.—H. R. Sweeting & Wm. Mansbridge, *Hon. Secs.*

City of London Entomological Society.—*February 7th*, 1911. —Mr. Chas. H. Williams was elected to membership.—Mr. S. J. Bell exhibited a series of *Anticlea rubidata*, all of bright red form, bred from Isle of Wight ova.—Mr. G. Brooks, a very dark brown *Smerinthus populi*, Barrett, 1910.—Mr. H. M. Edelsten, a series of *Malacosoma castrensis*, from Essex coast, including several unicolorous specimens. —Mr. V. E. Shaw, *Noctua augur*, var. *omega*, Finchley, June 28th, 1910, mentioned in Tutt's 'British Noctuæ,' &c., as a very rare form. —Mr. L. W. Newman stated that osier stumps collected for *Trochilium bembeciformis* were found to contain both full fed and young larvæ: the stumps being kept on the concrete floor of a hothouse during the winter, the young larvæ migrated from the small to the larger stems, fed up, and pupated. Mr. Newman also drew attention to the fact that, while larvæ of *Ægeria culiciformis* pupate head upwards in the stumps of birch, when feeding in year-old stems they pupate head downwards above the emergence cap.

February 21st, 1911.—Mr. L. W. Newman exhibited sticks showing borings of *T. bembeciformis* in both living and dead wood, also sticks containing larvæ of musk-beetle which feed side by side with *T. bembeciformis*, and display similar habits.—S. J. Bell, *Hon. Sec.*

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology. Vol. iv. No. 3, Dec. 20th, 1910; No. 4, March 10th, 1911. University Press, Liverpool.

These fine periodicals deal but little with entomology pure and simple, being mainly taken up with important papers on "Sleeping-Sickness" and other tropical diseases, mainly due to the operation of insects. The last paper of each number (in both cases by R. Newstead and H. F. Carter) is devoted to the description of new genera and species of mosquitoes. These are well illustrated, and should appeal to readers of the 'Entomologist' who study the Diptera. There is also a paper on *Glossina* by R. Newstead in No. 3.

W. J. Lucas.

On some New Species of Leaf-hopper (*Perkinsiella*) *on Sugar Cane.* By F. Muir (Bulletin No. 9, Entomological Series. Hawaiian Sugar Planters' Association). Pp. 1–14, five figures in text. Honolulu, 1910.

Of the thirteen species of *Perkinsiella* referred to, eight are described as new. The author remarks that the species may be separated by superficial characters as tabulated, but that the males are best distinguished by the genitalia.

Obituary.—We have heard, with very great regret, that our valued correspondent, Mr. W. A. Rollason, died on April 17th last.

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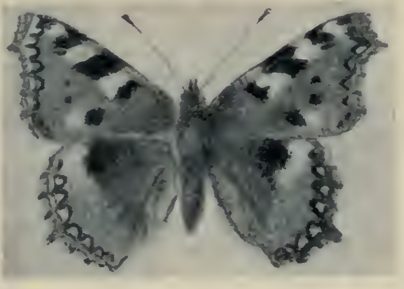
THE NATURAL HISTORY MUSEUM FOR NATURALISTS.

SURELY in no other country in the world would Natural History be placed officially in the same category as Chemistry or Physics. Yet that is apparently the classification favoured by H.M. Government of the present day and the Office of Works whose duty it is to look after the structural arrangements of our particular museum at South Kensington. As every entomologist is or ought to be aware, certain cellars, offices, and passages in the basement of this fine building are consecrated to the entomological collections. For years past these collections have been steadily growing in bulk, until, with the advent of the Walsingham Gift, the periodical library had to be "moved on," and every available square foot apportioned for cabinets, leaving but a trivial margin of elbow-room for the assistants whose work is done in these subterranean regions. By these, as by every other member of the Museum staff, however, this inadequate space has been regarded as a temporary shift. The day would surely come when the Trustees would be empowered to extend their borders on the remaining vacant sites formally allotted the Natural History Museum in 1899. That was then on the eve of the war in South Africa. With the campaign in progress, all hope of extension was abandoned for the time being; the staff was reduced, and the small sums saved thereby devoted to national needs! For ten years and more, therefore, the extension scheme has been hung up, and now there seems every reason to anticipate that it may be "drawn and quartered as well"! In other words, acting upon the advice of Sir Henry Roscoe and certain scientists concerned for the success of the projected "Science Museum," the Office of Works has decided to re-take the whole available "extension" space along the north side of the Natural History Museum; to allocate a part of it to the "Science Museum," and to use the remainder for "approaches." Meanwhile, the "Spirit Museum" is to be transferred from its present position on this site, and re-erected on the westward frontage facing Queen's Gate—that is to say, exactly where the Entomological Section at present ends—despite the specially inflammable nature of its contents, hitherto purposely isolated from the main building. No wonder the Trustees are up in arms! No wonder that in a last appeal on the subject to the Office of Works they deprecate the "attempt to accommodate three important institutions, the Natural History Museum, the Imperial College of Science, and a much enlarged Science Museum, on so restricted a site," as showing "a want of appreciation of the inevitable future of these institutions," all three of which must needs be "hampered in their growth"! For we entomologists are not the only naturalists who will suffer by this astonishing attempt "to squeeze a quart into a pint pot," even though that pint be *imperial*! As naturalists we have no quarrel with the chemists or any other scientists for whom the new Museum is designed. But we do protest most emphatically against the appropriation of Natural History Museum ground for alien purposes, and deeply do we regret that for the moment we have no entomological members of Parliament, as was the case a short time ago, to voice our arguments and ventilate our grievances. Meanwhile, a very widely signed memorial to the Government has been prepared in London with the co-operation of the leading Universities, and resolutions have been passed by the Linnean, the Entomological, and the Royal Horticultural Societies, stating the case for the appellants with unmistakable precision. Something has been said, too, about approaching the Prime Minister, the Minister for Education, and the First Commissioner of Works on the subject, and the Entomological Society, at all events, has asked to be represented if any such deputation is formed. For, at the time of writing, it is abundantly clear that the Department responsible for the present undesirable scheme has considered only one side of the question. We trust, therefore, that no effort will be spared to repair the omission, and by such means avert perhaps an irreparable injury being done to our particular branch of science. So far, we have not heard one "unofficial" voice raised in favour of the Government proposal. On the contrary, Sir Henry Roscoe himself appears to be quite dissatisfied with the space allotted the Science Museum, while no single word of encouragement has greeted the Office of Works scheme in the Press, scientific or otherwise.

H. R.-B.

THE REGULAR TEMPERATURE VARIATION IN *VANESSA URTICÆ.*

BY T. REUSS.



V. urticæ var. *amploides* var. *falcoides.*

THE above figure depicts in its left half a form of *V. urticæ*, which I will call var. *amploides*, with relatively broad wings and almost straight marginal wing-border in the fore wings; the second costal blotch is broadest next the median nervure, and the outlines of the spot are almost straight. The right-hand half of the figure shows a form which I will call var. *falcoides*. The wings are comparatively narrow, with strongly curved outer marginal border, in extreme specimens approaching the shape of *P. c-album*. The second costal blotch is deeply dentated in outline, and the *costal part is broadest*. The details here described appear to be the only ones in *V. urticæ** that regularly obey the influence of temperatures either above 15–20° C. (var. *amploides*), or below 15–20° C. (var. *falcoides*), and both forms are *larval* forms, not pupal—*i. e.* the pupæ of larvæ bred in warmth and sunshine will emerge as the form *amploides*, even if kept in the cool and dark, while larvæ reared in the shade and exposed to the cool night air will produce *falcoides*, even if the pupæ were immediately transferred to heat and sunshine.

The "normal" form of *V. urticæ* appears from larvæ which, as in nature, are exposed at night to temperatures much below and by day (*if it is a sunny day*) much above 15–20° C. The normal specimens of *V. urticæ* are intermediate between *amploides* and *falcoides*; sometimes a falcoid costal blotch goes with an amploid marginal outline and broad wings (this combination is normal in the Corsican var. *ichnusa*, in which, however, as might be expected, the amploid wing breadth is *extreme*); sometimes a falcoid margin goes with an amploid costal marking, or else both details are without character.

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* I reared and set over seven hundred specimens from fifteen batches of ova for reference on these points especially this season. The two specimens figured belong to brood vii.

The above note on the natural conditions under which the sun-loving Vanessid larvæ live necessarily suggests their exposure to great *contrasts* of temperature, which would yet in England be less severe, owing to less sunshine (also less in intensity) than on the Continent, especially in the southern parts. Already in a note in the Ent. Rec. pt. 2, 1910, I recorded certain measurements of temperature taken among the nettles of a hedge-bank, suggesting that the "*ground climate*" in which the Vanessid larvæ lived was very different from the conditions we ourselves moved in. Thus on the nettles the sunshine causes temperatures up to and over 37–40° C. for many hours, even in England, and the sun-loving larvæ will not shelter from it till the heat rises to 45° C. (compare also the sunshine records of meteorological stations). When night falls, the cold among the nettles is greater than higher in the air by condensation and evaporation of moisture (compare the meteorological records of the ground or grass temperature at night). Often slight ground frosts occur up to June, and again already in August, while on the same dates by day the sun could shine and cause records of over 40° C. Only a series of dull cloudy days would produce a more medium range of temperature, but every glimpse of sunshine would be utilized by the larvæ to bask in.

As has already been suggested, the normal or commonest form of *V. urticæ* appears like a "cross" between the forms characteristic of the day temperatures (*amploides*) and of the night and shade temperatures (*falcoides*), as, indeed, should be expected. But while the southern variety of *V. urticæ* var. *ichnusa*, by its very broad, straight-bordered wings, shows that warmth and sunshine are predominant in the climate in which it lives, the English *V. urticæ* are much more falcoid in character, being, indeed, often of the form *falcoides*, and proving that here the temperatures *below* 15–20° C. exert "the main pull" in their development.

Of *V. io*, the forms corresponding to the vars. *falcoides* and *amploides* of *V. urticæ* are vars. *mesoides* and *teloides* respectively (*vide antea*, pts. 12, 1909 and 1910, and Ent. Rec. pt. 1, 1911); and, again, the var. *mesoides* (the shade-temperature form) seems to be most common in England. This form, in addition to the characteristic alterations in the ocelli, also *often* shows the "falcoid" characters in wing shape and costal blotch (which, however, *never* appear in var. *teloides*, the heat form).

After rearing some twenty thousand specimens in all of both species, I have been forced to the conclusion that no other varietal forms than those mentioned above are true "temperature" forms—*i. e.* that they can be produced *regularly in all members of any brood by the influence and within the limits of certain temperatures* acting on all stages, or at least up to the end of the larval stages, when already the direction of the ensuing pupal developments is, *in the case of these forms*, predetermined so far as to resist conversion by opposite influences acting on the pupal stage.

Thus the temperature limits within which *V. urticæ* var. *falcoides* (*V. io* var. *mesoides*) and *V. urticæ* var. *amploides* (*V. io* var. *teloides*) are reared exclusive one of the other (but not exclusive of other forms of variation, the details of which *associate* with either the falcoid or amploid characters) can be given at 6–15° C. and 20–40° C. respectively. The most generalized form of expression would read: not above 15° C. = var. *falcoides*, and not below 20° C. = var. *amploides*.

TWO NEW SPECIES OF TRICHOGRAMMATIDÆ FROM THE UNITED STATES AND WEST AUSTRALIA.

By A. A. Girault (The University of Illinois).

One of the following two species extends the known limits of the genus *Ufens*, Girault, recently described from the United States, to West Australia.

Genus Abbella, Girault.

1. *Abbella nympha*, sp. n. (normal position).

Female.—Length, 0·65 mm. Moderate in size for the genus.

The same as the type species of the genus (*subflava*, Girault), but differing from it as follows: More intensely yellow, not light greenish yellow; substigmal spot of fore wing obscure, only a faint cloud being present under and against the stigmal vein; antennæ differing in that the first funicle joint is slightly longer than wide, the second joint globular, as long as wide, both joints not distinctly wider than long, as in *subflava*; fore wings differing in having longer marginal cilia, in being smaller and shorter, in bearing an oblique line of discal cilia running back from the stigmal vein, the line moderately short and slightly curved, consisting of four or five cilia; also in having finer and denser discal ciliation.

With the general appearance of *Westwoodella americana* (Ashmead), Girault. General colour pale cadmium yellow, the colour uniform; antennæ concolorous, the legs pallid dusky yellowish, with the distal tarsal joint dusky; eyes and ocelli bright red; fore wings slightly fumated along their proximal halves, otherwise hyaline; venation concolorous with the legs. Abdomen having at least two dorsal transverse black bands across the distal half, both apparently encircling its respective segment; also at least a black spot on each of the proximal segments, one on each side. Proximal and distal joints of the antennal club dusky. Otherwise, body practically immaculate.

Fore wings with about sixteen lines of discal cilia across their widest portion, the ciliation mostly in regular lines; the wing comparatively small and narrow, yet pyriform in shape, the blade regularly rounded distad, and with the marginal cilia moderately long, somewhat over a third the greatest wing width. Posterior wings with a paired distinct line of discal cilia along the cephalic wing margin, and a third line farther caudad, which is faint, and with its cilia separated more from one another in the line. Longest marginal cilia of posterior wing (caudal margin) slightly shorter than the longest cilia of the margins of the fore wing. Parapsidal furrows complete; abdomen conic-ovate, about as long as the head and thorax united, sessile, the ovipositor projecting slightly from its tip. Tarsal claws all moderate in length; tibial spurs single, straight, moderately short, absent on cephalic tibiæ; strigils absent. (From one specimen, ⅔-inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Unknown.

Described from a single female specimen in balsam, received from Dr. L. O. Howard, and labelled: "Parasite on Diplosis? in stems of *Ambrosia artemisiæfolia*. Issued May 21, '97." Probably from Jassid eggs in *A. artemisiæfolia*, Linn.

Habitat.—United States (locality unknown).

Type.—Type, No. *13,793*, United States National Museum, Washington, D.C.; a female in balsam.

Genus Ufens, Girault.

1. *Ufens luna*, sp. n. (normal position).

Female.—Length, 0·60 mm. Exactly similar in general structure, appearance, and colour to the type species—*niger* (Ashmead)—but differing as follows: In the fore wings primarily: they have distinctly shorter marginal cilia, short in the type species, but here very short and close, hardly distinguishable from the edges of the wing; the discal ciliation is different, not so dense, the straight, distinct lines more numerous, consequently not peculiarly distinct as in *niger*; also the fore wing is fumated farther distad, and more distinctly, though not pronouncedly. In the legs: the posterior femora are more enlarged, ovate, and with a longitudinal lamellate sculpture. The posterior wings differ in being less pointed at tip, there the caudal margin bevelled off, curving convexly up to the tip of the straight cephalic margin; at this curve the marginal cilia abruptly shorten. Otherwise as in the type species, to which evidently it is closely allied. (From one specimen, ⅔-inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Unknown.

Described from a single female specimen received from Dr. L. O. Howard, mounted in balsam, and labelled : " 923. Perth, W. Austr. G. Compere."

Habitat.—West Australia (Perth).

Type.—Type, No. *13,794*, United States National Museum, Washington, D.C. ; a single female in balsam.

BRACHYPTEROUS EARWIGS.

By Malcolm Burr, D.Sc., M.A., F.E.S., F.L.S., F.Z.S., &c.

In the earwigs, as in the true Orthoptera, and also in the Hemiptera, we find that brachypterism in normally macropterous species, and *vice versa*, is a frequent form of dimorphism. Thus, in *Marava grandis*, Dubr., *Labia tetragona*, Bor., *L. unidentata*, P. Beauv., *Echinosoma parvulum*, Dohrn, *Allostethus indicum*, Hagenb., and many other species, macropterous specimens are as frequent as those with shortened wings.

The absence of the protruding squamæ, or chitinised portion of the wings, from beneath the elytra materially alters the superficial appearance of the creature. When the wings are abbreviated, the elytra are often, but not always, correspondingly reduced to a lesser, but distinct, degree, in which case they are apically truncate. The disturbance also frequently affects the pronotum: thus in *Marava grandis*, Dubr., in the macropterous forms, the pronotum is decidedly broadened posteriorly, the hinder margin gently convex, and hinder angles distinctly rounded; whereas in brachypterous specimens the pronotum is not trapezoidal, but square, the sides being parallel, and posterior margin truncate. The superfical appearance of the creature is so altered by these reductions that two dimorphic forms are not infrequently described as distinct species; thus *Forficula miranda*, Borm., and *Nesogaster aculeatus*, Borm., are respectively the macropterous and brachypterous forms of one and the same insect.

We find the same phenomenon in the polymorphic and ubiquitous *Labidura riparia*, Pall., of which some brachypterous forms, with reduced elytra and squared pronotum, have been placed in a special genus, *Demogorgon*, Kirby, which, needless to add, cannot stand.

But brachypterism has not yet been recorded in the common earwig, *Forficula auricularia*, L. There is, however, known in Italy a rather rare species *F. silana*, Targ. (=*F. targionii* Br.), which only differs from the common species in the broader, more truly rectangular pronotum, truncate and somewhat shortened elytra, and aborted wings; it is, in fact, nothing more or less than a brachypterous form of *F. auricularia*. But it is customarily regarded as a good species, since it is only known from Italy, and no brachypterous specimen of the much-examined *F. auricularia* has ever been recorded from any other country, at least to my knowledge. In the structure of the body, coloration (a quite unimportant feature), and armature of the forceps, *F. silana* is otherwise indistinguishable from the common earwig.

Now when collecting at Compton Bay, in the Isle of Wight, in the summer of 1903, I took, among a lot of ordinary *F. auricularia* crawling in a heap of cowdung, two females with aborted wings: it seems necessary therefore to refer them to *F. silana*, hitherto regarded as a rare species confined to Italy.

The true explanation is probably that we have here the same dimorphism occuring sporadically in the common earwig, and that for some reason it is a more frequent phenomenon in Italy than elsewhere.

It is highly desirable that more material be obtained, and I hope and trust collectors will keep a sharp eye open in this country, and on the Continent, for specimens of the common earwig having reduced wings.

There is another possible, but improbable, explanation.

There is in the Mediterranean province another pair of species, which stand in the same relation to each other as *F. auricularia* and *F. silana*: these are *F. decipiens*, Géné, and *F. lurida*, Fischer. They both differ from *F. auricularia* and *F. silana* in the absence of the strong tooth at the end of the dilation of the male forceps. *F. decipiens* is brachypterous, and ranges in the western Mediterranean lands; *F. lurida* is macropterous, and occurs throughout the Levant.

The females of these four species are practically indistinguishable, so there is the possibility that these two females of mine may be referable to *F. decipiens*. But as that is a purely meridional species, this is very improbable. The discovery of the male would at once settle the question.

I called attention to this interesting problem in the Ent. Mo. Mag. 1907, p. 173, hoping that it would stimulate search, but the enquiry has produced no results.

May I appeal to Coleopterists, Hemipterists, and other collectors who use the sweep-net, to look out for brachypterous specimens of the common earwig and to send them to me?

Dover: January, 1911.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

By E. H. Strickland (Dip. S.E.A.C.).

(Continued from p. 182.)

Culicada inornata, n. sp.

Thorax dark brown, clothed with golden brown scales, on the posterior half are two lateral lines of whitish scales, spreading from the white pre-scutellar patch. Scutellum white scaled. Abdomen black, scaled with indistinct white lateral spots, and basal bands on some of the segments. Tarsi with poorly defined yellowish white basal bands.

♀. Head black, clothed with rather dull yellow narrow curved scales, and similarly coloured upright forked scales at the back and middle area of the head, which appear to be black in certain lights. The lateral flat scales are white. A few golden yellow bristles project between the eyes. There is a narrow margin of more white-coloured scales bordering the eyes. Eyes bronzy. Palpi with white scales at the apex, remainder dark scaled with a few white scales scattered over the upper surface. Clypeus black. Antennæ with basal joint mainly dark with a few white scales. Second and third joints mainly testaceous. Proboscis rather short. Thorax dark brown, clothed with dull golden brown scales. On the posterior half are two indistinct curved lateral lines of paler scales. The scales before the scutellum are whitish. Scutellum clothed with white narrow curved scales. Prothoracic lobes and pleuræ with white scales. Abdomen black, scaled with traces of dull white basal bands forming a median patch on all segments. There are small irregular lateral dull white spots on some of the segments. The ventral surface is clothed with white scales. The femora and tibiæ are spotted, the former are mostly white scaled below. Knee spots yellow. Tibiæ unbanded. Tarsi not very definitely banded with narrow yellowish-white bands. Fore and mid legs with apical tarsus unbanded. Hind legs with all tarsi banded, though the bands on the metatarsus and apical tarsal are very rudimentary and incomplete.

Wings not very densely scaled, the first fork cell is longer and narrower than the second posterior cell. Its stem is about half the length of the cell. The supernumerary and mid cross-veins are nearly in line, the former being slightly nearer to the wing base. The posterior cross-vein is rather less than its own length distant from the mid cross-vein. Halteres with light stems and blackish knobs.

Length 5 mm.

Habitat.—Tasmania.

Observations.—Described from two rather damaged females. It is apparently a true *Culicada*, the palpi being much longer than those one usually finds in *Culex*.

Culicada demansis, n. sp.

Thorax deep brown, with uniform golden brown scales. Scutellum with creamy scales. Abdomen black with dull white incomplete basal bands on all, and lateral white spots on some of the segments. Tarsal bands white, very broad on the hind tarsi, which character at once distinguishes this species.

♀. Head black. The narrow curved and lateral flat scales are creamy yellow, and the rather sparse upright forked scales at the back of the head are black. The palpi are long, clothed with black scales except for the white apex, and a few white scales at the junction between the second and third segments, and the junction between the first and second segments. Proboscis entirely dark scaled. Antennæ black, the basal segment is dark brown and only a little lighter in colour than the remaining segments.

Thorax deep brown, with uniform golden brown scales, which are perhaps a little darker laterally; just behind the prothoracic lobes are a few creamy narrow curved scales. Prothoracic lobes and scutellum with creamy narrow curved scales. Pleuræ with creamy scales. Abdomen black with dull white incomplete basal bands on all segments, none of which reach the lateral margins where, however, in some segments there is a small whitish lateral spot. Ventral surface with dull white scales, and a few scattered darker scales. Femora and tibiæ light testaceous. Femora light scaled below, except for apical third, and dark scaled elsewhere with a few scattered whitish scales. Knee spot ochreous. Tibiæ unbanded. Tarsi with broad white bands, all apical tarsi unbanded; fore and mid legs with fourth tarsi also unbanded. Banding very deep on hind legs.

Wings rather densely clothed with dark brown scales. The first fork cell is longer, but narrower than the second posterior cell, its stem is over half the length of the cell. The supernumerary and mid cross-veins form a straight line with each other. The posterior cross-vein is about its own length distant from the mid cross-vein. Halteres, light stems and knobs.

Length 5 mm.

Habitat.—Tasmania.

Observations.—Described from one rather damaged female.

As only one specimen was sent, the ungues could not be well examined, so the relationship of this species to others of the genus *Culicada* cannot at present be determined.

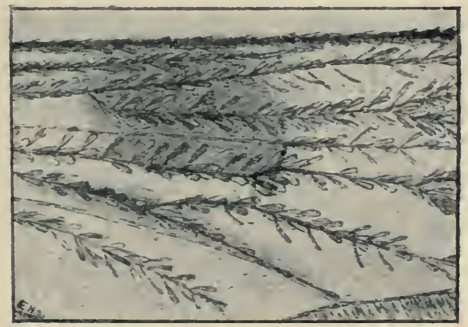
Culicada vandema, n. sp.

This species varies very much in thoracic scale ornamentation, from uniform dark brown scales to a variety which possesses many golden scales, especially on the median area. Abdomen unbanded, but with ochreous lateral spots on some segments. Legs testaceous with yellowish tarsal bands. The distinctive character of this species is a large dark area in the centre of the wing.

♀. Head black on the vertex and yellow at the sides and back. The narrow curved scales are uniform in size and of a light golden colour. The upright forked scales are all black, and the lateral flat scales are of an ochreous tint. The basal antennal segment, together with the greater part of the second segment, is testaceous. Clypeus testaceous. Palpi dark scaled, somewhat lighter below. Proboscis dark scaled with scattered lighter more yellowish scales.

Thorax dark brown, sometimes with a lighter median band, and lighter basal lateral patches. The scales are uniformly dark brown; some specimens, however, have a few scattered golden scales. Scutellum with light yellow narrow curved scales. Abdomen black scaled on the basal segments gradually giving place to dull ochreous scales on the apical segments. None of the segments are banded, but dull ochreous lateral spots are present on some of the segments. Ventral surface dark scaled with a few scattered ochreous scales. Femora all mottled, but are mainly dark above and light below. Tibiæ dark scaled with a few ochreous scattered scales. Tarsi with yellow basal bands.

Wings with a dark brown cloud extending from the costa to the fourth longitudinal vein in the one direction, and from the base of the second longitudinal forward to the supernumerary and mid cross-veins in the other direction. There is also another slight cloud along the fifth longitudinal vein which follows the lower branch of the fork. The supernumerary and mid cross-veins are almost in a line with each other, and the hind cross-vein is not quite its own length distant from the mid cross-vein. First fork cell narower and a little longer than the second posterior, its stem is not half the length of the cell. The scales are rather dense, and are mottled dark brown and yellow. Halteres, light ochreous stems and knobs.



Portion of wing of *Culicada vandema*, n. sp., showing mottled scales and the clouded patches.

Length 5·5–6 mm.

Habitat.—Tasmania.

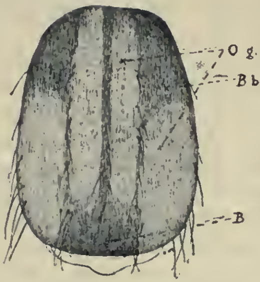
Observations.—Described from five female specimens.

This is a very distinctive species owing to the dark cloud on the wings which is very clearly defined. The species itself, however, appears to be subject to much variation in thoracic adornment, as all the five species varied from each other in this respect. A description of a marked variety is appended.

Culicada vandema var. *variegatans.*

♀. This variety is true to the description of *C. vandema* given above in all respects, with the exception of the thoracic ornamentations.

The thorax is for the greater part of an orange brown colour. There is a deep brown median line which terminates in the pre-scutellar area, which is also dark brown and devoid of scales. On either side of this area a narrow line runs forward, parallel with the dark median line to dark lateral patches which occur on the apical third of the thorax, as shown in the diagram. The narrow curved scales are of a bright golden colour all over, with the exception of over the dark lateral patches, where they are replaced by dark brown scales.



Thorax of *Culicada vandema* var. *variegatans.*

O.g. = Deep orange. Golden scales.
B.b. = Dark brown. Brown scales.
B = Dark brown. No brown scales.

Observations.—Described from a single female.

The other specimens which varied from the typical description appeared to be intermediate stages between the type and this variety, but in none of them were the golden coloured scales on the thorax much in evidence.

(To be continued.)

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 176.)

Thosea castanea, sp. n.

Reddish brown. Fore wings silky, rather darker towards the base; a darker, diffuse, slightly sinuous band from costa near apex to outer margin at vein two.

Expanse, 23–25 millim.

Collection number, 738.

Two male specimens from Kanshirei (1000 ft.), July 24th, 1906.

Narosa nigrisigna, sp. n.

♀. Fore wings white, sprinkled with ochreous brown on basal and inner marginal areas, clouded with darker ochreous brown on medial and outer areas; some black scales at end of cell, and a black sinuous line beyond; a marginal series of black dots. Hind wings whitish, thickly sprinkled with ochreous brown.

Expanse, 21 millim.

Collection number, 608.

Two female specimens from Kanshirei (1000 ft.); one August, 1907, the other October, 1908.

Narosa corusca, sp. n.

♂. Fore wings yellowish white, mottled and streaked with pale reddish brown, the latter most in evidence between the veins; postmedial line darker reddish brown, sharply angled above the middle, thence wavy to inner margin; a darker reddish brown spot at end of cell; a series of black dots on the outer margin, one between veins two and three largest; fringes with a darker central line. Hind wings yellowish white, fringes paler. Under side yellowish, veins and fringes whitish.

♀. Similar to the male, but the space between end of cell and postmedial line is filled up with the darker reddish brown colour; some blackish dots on the postmedial line at angle and below; the black dot between veins two and three is rather larger than in the male, and between it and the dot at angle of the line is an intermediate dot.

Expanse, 27 millim.

Collection number, 61.

One example of each sex from Kanshirei (1000 ft.); the male captured in May, 1907, and the female in May, 1908.

Allied to *N. fulgens*, Leech, from Gensan and Ningpo.

Natada furva, sp. n.

Head, thorax, and abdomen pale brownish. Fore wings pale brown, freckled with darker; a diffuse patch of blackish scales in the cell, and an elongate one below it extending to the inner margin; traces of a dusky submarginal line. Hind wings and under side of all the wings fuscous.

Expanse, 19 millim.

Collection number, 676.

Two male specimens from Kanshirei (1000 ft.), August 20th, 1905.

The second specimen is in poor condition, but it has a distinct black spot at end of cell, of which there are only faint traces in the type specimen described; black scales are not present in cell, and the patch of black scales near inner margin is very much reduced.

Tetraphleps (?) *rugosa*, sp. n.

♂. Head and thorax chestnut-brown, patagia blackish brown; abdomen dark brown, basal segments chestnut-brown above. Fore wings blackish, rather glossy, but with a rough and crumpled appearance; the costa is brown from middle to apex, and there are three brown clouds—one at lower angle of cell, one between this and inner margin, and a larger one before the outer margin. Hind wings and the under side of all the wings, fuliginous.

Expanse, 34 millim.

Collection number, 736.

One male specimen from Kanshirei (1000 ft.), July 18th, 1908.

Miresa vulpina, sp. n.

♂. Head and thorax bright reddish brown, abdomen rather duller. Fore wings reddish brown, flecked with glossy whitish scales; postmedial line blackish, incurved before the inner margin. Hind wings paler.

Expanse, 42 millim.

Collection number, 726.

One male specimen from Kanshirei (1000 ft.), June 17th, 1908.

Near *M. inornata*, Walk.

(To be continued.)

ICHNEUMONIDÆ TAKEN IN CORNWALL, 1910.

By W. A. Rollason, F.E.S.

In contributing this report of my past season's captures, I have first to deplore, in common with most brother entomologists I presume, the extremely bad climatic conditions which prevailed throughout the year, and with such short periods of what the entomologist would call favourable weather for collecting. Following as it did the bad season of 1909, it proved particularly disastrous for Lepidoptera; consequently I was rather agreeably surprised to find ichneumons almost as plentiful as in the previous year, when I took nearly two hundred and thirty insects, the more important species of which I recorded in last year's volume of this Journal (pp. 53 and 54); this year my total was about one hundred and seventy, the decrease being due to absence from the county for a fortnight and a further period of nearly three weeks, when the pressure of some special work prevented my taking any excursions. I have again to express my indebtedness to Mr. Claude Morley, F.E.S., F.Z.S., for the encouragement and generous assistance he has rendered in the determination of all the following species, the record of which will, I trust, prove of interest and value:—

Nine Species New to Cornwall.

Barichneumon lepidus, Grav.—One male, July 2nd, near Scawswater; one male, September 12th, Lizard district.

Microcryptus sericans, Grav.—One male, July 2nd, near Truro; there is no British record instanced in Morley's vol. ii., but in MS. from him, dated November 21st, 1910, he says, "I have now a single male from Scotland." [There are two males in Mus. Brit. from Bugbrooke, in Northants (Marshall), and Stephens's coll.—C. M.]

Panargyrops pellucidator, Grav.—One male, June 4th, Devoran.

Pycnocryptus peregrinator, Linn.—Three males and two females, July 8th and 9th, near Scawswater and Calenick, on *Heracleum* flowers.

Cryptopimpla errabunda, Grav.—One male, June 26th, Truro; one female, September 9th, Lizard district. This is a very rare insect; Morley, in his vol. iii., gives only three records for Britain.

Bassus dimidiatus, Schr.—One female, July 10th, Truro.

Polyclistus (*Exochus*) *mansuetor*, Grav.—One, September 5th, Carnon Croft.

Erigorgus melanobatus, Grav.—Five males, April 30th, one female, May 21st, north coast.

Olesicampa fulviventris, Grav.—One female, May 16th, near Falmouth.

ONE VARIETY NEW TO CORNWALL.

Meniscus pimplator, Zett.—One male variety, September 30th, near Truro.

The following list of twenty-six species gives my further captures, which species, although having previously been recorded, have not in some instances been reported with data for many years:—

Cœlichneumon lineator, Fab.—One male, July 23rd, Calenick.

Melanichneumon leucomelas, Gmel.—One female, September 27th, Truro, walking on footpath of a street in the city.

Barichneumon albicinctus, Grav.—One female, July 8th, near Scawswater, on *Heracleum* flower.

Ichneumon terminatorius, Grav.—One female, September 5th, Lizard district, on *Angelica* flower.

I. confusorius, Grav.—One female, April 20th, Truro, at rest on a stone in garden; one female, May 16th, near Feock, on *Umbellifera* flower.

Exephanes hilaris, Grav.—One female, May 16th, near Feock, on *Umbellifera* flower. (An uncommon insect.)

Chasmias motatorius, Fab.—One male, September 5th, Carnon Croft, on *Angelica* flower; three males, September 9th, 10th, and 13th, Lizard district.

Amblyteles armatorius, Forst.—One male, July 10th, Truro.

Probolus alticola Grav.—One male, September 1st, bred from a wild Truro pupa, species unknown. (An uncommon insect.)

Eurylabus tristis, Grav.—One male, July 8th, near Scawswater, on *Heracleum* flower; one female, July 9th, Truro, on leaves of *Amaryllis fulva* in garden.

Platylabus pedatorius, Fab.—One male, June 17th, Calenick.

Cryptus albatorius, Vill.—Four males, June 3rd, 4th, and 17th, Calenick and Devoran.

Perithous mediator, Fab.—Two males, September 14th, Lizard district.

P. divinator, Rossi.—One female, September 14th, Lizard district.

Pimpla ruficollis, Grav.—One female, May 13th, Truro; a rare insect, only once previously recorded for Cornwall (Land's End district), and seven records only for Britain; see Morley's vol. iii.

P. nucum, Ratz.—One female, July 8th, near Scawswater, on *Heracleum* flower.

P. oculatoria, Fab.—One female, July 8th, near Scawswater, on *Heracleum* flower.

Clistopyga incitator, Fab.—One male, June 26th, one female, June 27th, Truro.

Glypta monocerus, Grav.—One male, July 2nd, near Idless, on *Heracleum* flower.

G. sculpturata, Grav.—One female, September 5th, Carnon Croft.

G. bifoveolata, Grav.—One male, July 23rd, Truro, on *Heracleum* flower.

Meniscus murinus, Grav.—One male, May 16th, near Feock; one male, May 24th, Truro; one male, June 3rd, Calenick.

Phytodiætus coryphæus, Grav.—One female, June 17th, Calenick.

Banchus pictus, Fab.—One male, July 8th, near Scawswater, on *Heracleum* flower.

Polyblastus variitarsus, Grav.—Two males, June 17th, Calenick.

Campoplex falcator, Thunb.—One female, July 9th, Calenick, on *Heracleum* flower.

A considerable number of my captures for 1909 and 1910 are as yet undetermined by Mr. Morley, amongst them being a few Braconidæ.

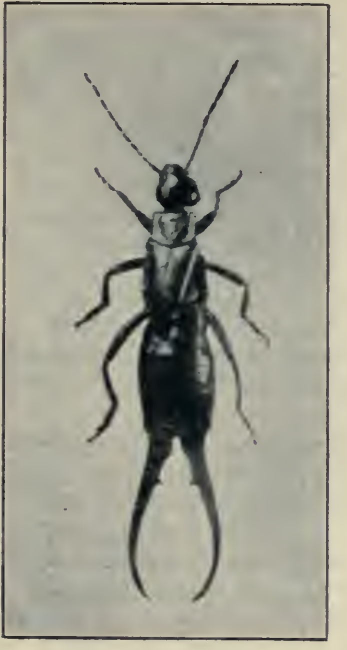
The following species I recorded as "new to Cornwall" in 'Entomologist,' vol. xliii. p. 53, 1910, and have again taken this year:—*Microcryptus abdominator*, Grav., *Idiolispa analis*, Grav., *Pimpla robusta*, Morl., *Stilbops chrysostoma*, Grav.

"Lamorna," Truro: February 13th, 1911.

NOTES ON BRITISH ORTHOPTERA IN 1910.

By W. J. Lucas, B.A., F.E.S.

Forficulodea.—On August 10th I visited one of the localities for *Labidura riparia* on the shore in the Bournemouth district, accompanied by Mr. J. J. F. X. King, who wished to see the insect at home. The earwigs seemed to be scarce on that occasion, and we secured only four between us—two rather small male imagines, a female imago, and a very small nymph. One of the males had lost a wing, or at any rate the exposed part of it; the elytron, however, was present. *Forficula auricularia* is reported as ubiquitous in Linlithgowshire (S. E. Brock). A very large var. *forcipata* was taken on July 26th, by Mr. P. M. Bright, on the cliffs at Freshwater, in the Isle of Wight, and given to Mr. King. The length of the insect was 25 millimeters, 10 mm. of which were due to the callipers. These were so long that Mr. King at first took the insect for a specimen of *Labidura riparia*, which has been reported from the island, though I believe it is a long time since it has been found there. When the earwig was etherised, two dipterous larvæ belonging to the Muscidæ emerged, each about 6·25 millimeters in length. As I had not a lens with me in the New Forest suitable for making an enlarged photograph, Mr. G. T. Lyle was kind enough to take and give to me a negative of the insect (× 2·4) which is here reproduced.*



Mr. J. J. Walker (*in. litt.* November 9th, 1910) informed me that he had twice taken *Forficula lesnei* singly during 1910, at Cothill, near Abingdon, in Berkshire, on September 18th and 20th respectively. [Writing later he stated that on October 3rd, 1907, he took a female by sweeping on Merrow Downs, between Guildford and Newlands Corner, Surrey.]

Blattodea.—*Ectobius lapponicus* was taken near Ramnor, in the New Forest, on August 9th. At Holm Hill, in the New Forest, on August 21st, when breaking up and examining the trunk of a small dead burnt pine, I met with two or three specimens of *Ectobius panzeri*. At the same time a *Scolopendra* (centipede) was captured, holding one of these cockroaches, which apparently it had just caught. Though not dead, the cockroach moved but little; possibly the centipede may have paralysed it, but that I cannot say. While I watched, the centipede seemed to be using its poison-jaws much as if they were legs. The cockroach was held beneath the captor's body by several of the anterior pairs of legs, ventral surface upwards; I presume in order that the softer parts of the prey might more easily be devoured. The centipede seemed distressed because it could not hide, but nevertheless fed greedily on the cockroach, sometimes waving its antennæ vigorously. The centipede was livid pink in colour, a rather small species, or perhaps the young of a larger kind. In the insect-house at the Zoological Gardens, Regent's Park, on October 23rd, numbers of large cockroaches, apparently *Periplaneta americana,* were continually emerging from the grating over the hot-water pipes. They ate readily some sugar put down for them.

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* It will probably be noticed that the insect when photographed was in a slightly damaged condition as regards head and thorax.

Gryllodea.—Early in the year Mr. G. T. Lyle sent me alive three specimens of the New Forest cricket (*Nemobius sylvestris*), which he had found crawling and hopping about on fallen sweet-chestnut leaves in the New Forest, on February 12th, 1910. Two were small, but the third, a female, appeared to be full-grown. Of the small ones he saw great numbers, but he met with only the single large specimen. So early a date for an imago is important.

Locustodea.—A specimen of *Phasgonura viridissima* from Ranmore, Surrey, on August 13th, has already been referred to in these pages. A female nymph of the same species, sent to me by Mr. G. T. Lyle from Beer, Devon, on July 27th, shortly after its arrival underwent its last change and became a crippled imago. With it was also sent a nymph of *Pholidoptera griseoaptera* (= *cinereus*). An example of the last species, taken at Yarmouth, in the Isle of Wight, in August, was shown to me by Mr. E. A. C. Stowell. On September 2nd a male was captured at Fordingbridge, in Hampshire. Mr. J. G. Dalgliesh tells me that he took an example of the interesting species *Conocephalus dorsalis*, near Witley, in Surrey.

Acridiodea.—In this group also I have little to note except the addition of a few dated localities to the list. *Gomphocerus maculatus* is locally common in Linlithgowshire, the earliest date on which it has been heard being July 4th (S. E. Brock). Other localities are Lumphanan, in Scotland, July 15th–31st (K. J. Morton), Yarmouth, Isle of Wight, August 11th (W. J. L.), and near Oxshott, Surrey, on September 13th (W. J. L.). *Omocestus viridulus* is common and generally distributed throughout suitable localities in Linlithgowshire, the earliest date on which it has been heard being June 29th (S. E. B.). It is also recorded from Lumphanan, July 15th–31st (K. J. M.) ; Hengistbury Head, Hants, August 5th (W. J. L.) ; and Yarmouth, Isle of Wight, August 11th (W. J. L.). *Stauroderus bicolor* : Yarmouth, Isle of Wight, August 11th (W. J. L.) ; Hayling Island, Hants, in August (D. Sharp) ; near Oxshott, Surrey, September 13th (W. J. L.) ; and a good number on the links north of Tynemouth, Haddingtonshire, on October 1st (W. Evans). *Chor-*

thipphus parallelus: Lumphanan, July 15th–31st (K. J. M.); Beer, July 27th (G. T. Lyle); Hengistbury Head, Hants, August 10th (W. J. L.), and Yarmouth, Isle of Wight, August 11th (W. J. L.) On September 4th I visited Silverstream Bog, in the New Forest, for *Mecostethus grossus*. They were not much in evidence, although there was a good amount of sunshine; but the wind was cool. Some six or eight were seen and five were captured—four males and one female. A male and a female, kept alive, were taken to Kingston-on-Thames on September 10th, and there placed in a large fish-globe containing *Sphagnum* and a tuft of grass, the top of the globe being covered with muslin. One was noticed eating the grass, holding the blade with its fore-legs in a very "human" manner, in order to bite along the edge. They were seen paired more than once. The male was dead on September 18th, while the female succumbed about September 26th, the latter having eaten much grass a few days before. *Tetrix bipunctatus* occurred at Box Hill, Surrey, on July 2nd. On August 1st, at a damp spot in a ride of Vinney Ridge Inclosure, in the New Forest, where grass was luxuriant, a number of grasshoppers were found dead, but holding to the grass as if simply resting there. Perhaps all were *O. viridulus*. In some cases the abdomens seemed unduly distended, but there was no obvious cause of death.

Kingston-on-Thames: May, 1911.

SOME ICHNEUMONIDOUS SYNONYMS.

By Claude Morley, F.Z.S.

Clearing up synonymy is one of the most beneficial points in the present study of Ichneumonidæ and, though difficult and often dangerous in the absence of type-specimens, it is rendered comparatively easy when one or other of specimens described is before one. I have found in the British Museum all the types of the eight kinds shortly diagnosed by T. V. Wollaston in Ann. Nat. Hist. 1858 (ser. iii. vol. i. pp. 21–23). None of them have been mentioned in literature since first brought forward, and they have been nothing but a cumbrance to the monographer. They were doubtless examined by Francis Walker, who has placed many manuscript names upon other insects in the same collection, regarded as new by him. As far as my knowledge extends, the synonymy of those published should stand thus: (1) *Picrostigeus* (*Orthocentrus*) *anomalus*, Holmgr. Sv. Ak. Handl. 1855, p. 351, male = *Misoleptus* (sic) *maderensis*, Woll. *l. c.* 21, pl. iv. fig. 1. (2) *Phygadeuon vagans*, Grav. Ichn. Europ. ii. (1829), 738, female = *Hemiteles postica*, Woll. *l. c.* p. 22. (3) *Exetastes peregrinus*, Woll. *l. c.* p. 22, pl. iv. fig. 2, male (sic) = *Campoplex angustatus*, Thoms. Opusc. Ent. xi. (1887), 1061, female. (4) *Ephialtes lateralis*, Woll. *l. c.* p. 22, female, I regard as a good species, though extremely closely allied to *E. ruficollis*, Desv., and most probably nothing more than a meridional form of it, with terebra variable in length and not always as long as the body, the outline stouter and thorax darker. (5) *E. lineatus* Woll. *l. c.* p. 22, female, is also a good species belonging rather to *Exeristes* than to *Ephialtes*; in the two co-types the terebra is nearly as long as the body. (6) *Ephialtes linearis*, Woll. *l. c.* p. 22, male and female, is a *Clistopyga* unknown to me, but possibly *C. erythræa* or *C. rufescens*, Fonsc. Ann. Soc. France, 1854, p. 518; Walker regarded the female as *Perithous mediator*! (7) *Lissonota dorsalis*, Woll. *l. c.* p. 23, male, *nec* Grav. et Fonsc. is a *Pimpla* sensu Thoms., represented by one of each sex. (8) *Bassus albovarius*, Woll. *l. c.* p. 23, is a small and dark *B. lætatorius*, F., a common species in Madeira, the Ichneumon fauna of which appears to be distinctly Palæarctic rather than African.

Cryptus pulcherrimus, Kirby [Bull. Liverpool Mus. iii. (1900), p. 14 et the Nat. Hist. of Sokotra and Abd-el-Kuri, by H. O. Forbes, 1903, p. 237], belongs to the genus *Acroricnus*, Ratz.; both sexes, including the typical female, are in Mus. Brit.

Amblyteles ludovicus, Cameron, from Yatsurhiro, in Japan (Trans. Nat. Hist. Soc. Glasgow, 1883, p. 272), is a female *Melanichneumon leucomelas*, Gmel., with European examples of which it agrees *ad amussim*. *Hoplismenus mikado*, Cam. (*lib. cit.* 1885–6, p. 274), from Kobe = *Trogus lutorius*, F., male, differing from the usual form only in its basally black second and third segments. *Callojoppa bilineata*, Cam., from Japan = *Trogus exaltatorius*, Panz., female. *Colpognathus magellansis*, Cam. (Proc. Manchester Soc. 1888, p. 129) is a female *Cryptus* (sensu Thoms.) with exserted terebra and strong mesopleural sulci.

Eight new species are brought forward by A. H. Haliday in "Description, &c., of the Insects collected by Captain P. P. King, R.N., F.R.S., in the Survey of the Straits of Magellan" (Trans. Linn. Soc. 1836, pp. 316–19), all of which are, of course, new, and I have examined the types in Mus. Brit. (1) *Ichneumon xanthorrhœus*, Hal., is a male *Platylabus*. (2) *I. plebeius*, Hal., male, is extremely like, though distinct from, *Ctenichneumon melanocastanus*, Grav. (3) *I. patricius*, Hal. (male, *sic*) is a female *Amblyteles*. (4) *Phygadeuon prælatus*, Hal. (male, *sic*) is a female *Ctenichneumon* with metallic blue body. (5) *Trachysphyrus imperialis*, Hal., female, a splendid metallic purple insect, which also occurs in Chili and is probably re-described in Claudio Gay's 'La Historia Fisica y Politica de Chile'—in Spanish—vol. vi.; the flagellum is entirely black, filiform, and extends to apex of basal segment. (6) *Cryptus bellicosus*, Hal., female = *C. nitidipennis*, Brullé, Hym. iv. (1846), 188; I have seen it from Valdivia (Walker), Temuco, Jan. 1906 (Middleton); Terra del Fuego, Dec. 1904, several (Crawshay);* Santiago (Rees), and Patagonia (Chubut). (7) *Pimpla sponsa*, Hal., is a female *Itoplectis*. (8) *Campoplex fugitivus*, Hal., is a *Limnerium* sensu lato, and single male and female are correctly associated. The *Chrysis* there named *C. cærulans*, F., which seems not to extend south of Guatemala, is much more closely allied to *Tetrachrysis carinata*, Spin. The specimen of *Ophion luteus*, Linn., that Haliday records thence is correctly named.

Many of the genera, ascribed to his species by Cameron in 'Biologia Centrali-Americana,' vol. i. pp. 135 (1884)–312 (1886), are incorrect, and some of the Mesolepti are referable to Lissonotini; but it is too long a task to touch here, and I will only say that a somewhat small proportion of the types are not in Mus. Brit., being either lost or in the Vienna Museum, where I believe all Bilimek's collection is to be sought.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. Distant.

Fam. BERYTIDÆ.

Capys gracilis, sp. n.

♂. Head ochraceous, the lateral margins behind eyes and a somewhat circular series of coarse black punctures at base, enclosing ocelli, black; pronotum with the anterior area ochraceous, remainder thickly blackly punctate with the margins and a central line ochraceous, scutellum blackly punctate; corium ochraceous, thickly finely blackly punctate; membrane greyish brown with scattered blackish markings; connexivum ochraceous with elongate black spots; body beneath black, abdomen with lateral marginal elongate ochraceous spots, coxæ ochraceous; antennæ with the first and second joints ochraceous finely speckled with black, fourth joint black, first joint more than twice as long as second, subequal in length to third, apex of first joint distinctly incrassate, fourth short and moderately thickened; head between antennæ armed with a moderately long curved spiniform porrect process; pronotum longer than broad, elongate, only moderately widened posteriorly; membrane reaching apex of abdomen; rostrum about reaching the posterior coxæ, its apical joint black.

♀. Abdomen beneath testaceous; membrane not reaching apex of abdomen. $6\frac{1}{2}$ to 7 millim.

Hab. Trichinopoly.

Differs from *C. malacaipus*, Stål, by the slightly shorter and somewhat more robust spiniform process to the head, the narrower pronotum, and the shorter and more thickened apical joint to the antennæ. Dr. Montandon kindly forwarded me this species.

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* Dalla Torre's reference to Dr. Thwaites (Tr. Ent. Soc. 1845, Proc. lvii.) is incorrect, and refers to *Cryptus bellosus*, Curt. (*Aritanis signatorius*, Fab.).

Some amount of conjecture has been formulated by Bergroth in relation to the generic name *Capys* as here used. In 1907 Breddin proposed a new genus *Capyella*, which Bergroth correctly surmised was only a synonym of *Capys*, Stål (1865). The name *Capys*, however, was also used in the same year by Hewitson for a genus of Lycænidæ. Bergroth states that Hewitson's name was published a little earlier than Stål's and that, therefore, *Capyella*, Bredd., could be used as a new name, but he does not give us any particulars as to the respective dates of publication, though probably he has some information that is neither known in Stockholm or London where these names were founded, and where I have sought—unsuccessfully—to discover exact dates of publication beyond that of the same year. I therefore do not consider that Bergroth at present is quite justified in this alteration, and I do not follow him.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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(Continued from p. 169.)

The Adephaga, Phytophaga, and, with some exceptions, the Lamellicornia also possess only one pair of these accessory glands. In the Phytophaga they are often bifurcate and sometimes look like two pairs, as, for example, in *Prionus* (fig. 7). Two or three pairs are usually met with in other groups. Their division into *ectadenia* and *mesadenia* seems to be purely theoretical and not yet confirmed by a study of their development; and I notice that whereas Ganglbauer classes the single pair in each of the three groups mentioned as *ectadenia*, Berlese, in his admirable work 'Gli Insetti,' describes those of the Lamellicorns and Phytophaga as *mesadenia*. Dr. Bordas, in adopting the names given by Escherisch, is careful to dissociate himself from any acceptance of the views implied as to the origin of the glands in each particular case. He himself suggests that those of the Longicornia would be more correctly described as *mesadenia*.

The Malpighian Vessels.—The importance of these in the classification of the Coleoptera depends upon their number and the view we take as to which is the more primitive number. In beetles they are always few in number, either four or six. The Adephaga, Staphylinoidea, and Lamellicornia have only four; the Heteromera, with some exceptions met with in the Meloidæ, the Phytophaga, and the Rhynchophora have six. The number varies in the other large groups, being usually four in the lower forms, such as the Malacoderms, and six in the higher and more specialized forms. So that, notwithstanding Wheeler's view that six was the primitive number of the nephridial vessels not only in Coleoptera but in all insects, it would seem that in the Coleoptera, at least, the tetranephric condition is more primitive than the hexanephric. Brauer believed that the primitive insect had only two pairs of nephridial ducts. Wheeler has brought forward many facts in support of his own view, but there are others which tell against it, and, on the whole, I think it is safe to conclude that the tetranephric Coleoptera are generally more primitive than those in which the hexanephric condition prevails.

The Nervous System. — As a result of the researches of Blanchard, Brandt, and other anatomists, the condition of the nervous system in many families of beetles is now fairly well known. The differences found in it relate mainly to the greater or less concentration of the ganglia in the ventral chain. It may be assumed as true that the greater the concentration of the ganglionic chain, the higher is the stage of development proceeding along the same line. This consideration has greatly influenced Ganglbauer in his arrangement of the family series, and of the different families in each series. The Rhynchophora show throughout a relatively very high concentration of the ganglionic chain; the Anthribidæ, which he considers to be the lowest and least differentiated of the families, being inferior to none of the others in this respect. The Scolytidæ, in which the concentration is greatest, he places chiefly for that reason at the end of the series. The Rhynchophora he considers to be of later origin than the Phytophaga, and doubtless derived from them, probably through the Bruchidæ, in which already there was shown a rather strongly concentrated nervous system.

The high degree of concentration of the nerve ganglia met with in all the Lamellicornia, except the Lucanidæ, seems to have been one of the chief factors in determining him to place the Lamellicornia as the highest and last group of all.

But the concentration of the ganglia of the ventral chain seems to be correlated with a general shortening of the body, especially of the hind body; so that it probably does, as Kolbe maintains, follow, merely as a consequence, the concentration of the body by a fusion of its segments and parts with one another.

External Morphology.—The characters so far considered are, with the exception of the wing-venation, somewhat outside the field of the ordinary systematist. But the characters with which he has mostly to deal—those derived from a study of the external form and structure of the body and its appendages—are scarcely less important and have by no means been neglected in our latest classifications.

In fact, the characters to be obtained from a study of the external form and structure of the body should, in Kolbe's opinion, outweigh all others, such as those derived from the internal organs or from the structure of the various appendages —wings, legs, antennæ, &c. In the head, its modifications of form, the presence or not of a distinct labrum, and the coalescence or otherwise of the gular sutures; in the prothorax, the extent to which, if any, fusion has taken place in its skeletal parts, the pleuræ with one another or with the notum or sternum; in the abdomen, the number of the segments, and, especially, the separation or fusion with one another of the sternites and pleuræ of the basal segments—these are the characters which have for Kolbe the greatest morphological and phylogenetic value. The chief direction of evolution in the Coleoptera has been towards a fusion of the basal sternites and pleuræ of the abdomen, and also of the skeletal parts of the head and thorax; this is, I think, a fair statement of the leading principle in his classification.

It can hardly be denied that that is one direction, and a very important direction, in which evolution has gone on in the Coleoptera; but it has proceeded also in many other directions; effecting changes in the structure of the wings, legs, and other appendages, no less than in the body itself, and every character has its value in phylogeny if it enables us to postulate of such or such a form that it cannot have been derived from such another. There are many characters of this kind to be met with in the Coleoptera, especially if the law be true that an organ or structure having once disappeared in the course of evolution will never again reappear. The application of this law, enunciated, as he says, by Meyrick, plays an important part in the phylogenetic speculations of Lameere, and there is little doubt that it can, if used with care, be made to yield very good results. It seems to me a safer method than that of considering one set of characters all-important.

The Rhynchophora are characterized, as a whole, not only by the great concentration of the ganglionic chain but also by the great extent to which fusion of the exoskeletal parts has taken place, and the great modification in form undergone by the head. Kolbe considers them, therefore, not only as a distinct group, but as the most highly organized of all the Coleoptera, and places them last in his classification.

But he has, I think, rather over-emphasized the distinctness of the group, and the extent to which fusion of the parts of the body has taken place.

Ganglbauer has pointed out that of all the characters assigned by Kolbe to the Rhynchophora, only two—the coalescence of the gular sutures and the disappearance of the sutures between the pleuræ and the sternum and notum of the prothorax—are characteristic of the group as a whole and confined to that group. But even as regards those two characters there are exceptions within the group. From my own observations I find that the gular sutures are quite distinct and as wide apart in the Oxycorinidæ as they are in many families outside the group; they are rather widely separated also in the genus *Rhinomacer*; and again in some Platypodinæ, as for example, *Crossotarsus*, they are, though strongly convergent behind, quite separate right up to the hind margin of the head. It is just possible that the absence of the gular sutures in many other Rhynchophora is not always, as is assumed to be the case, the result of their coalescence first and disappearance afterwards, but may sometimes be due directly to the strong chitinization of the integument, which is so general in this group. The disappearance of the prothoracic sutures admits to some extent of a similar explanation, although here it is only in the disappearance of the suture between the sternum and the pleuræ that they differ from most of the other Coleoptera, and even of this suture there are distinct traces left behind in many of the Rhynchophora. The suture between the notum and the pleuræ has altogether vanished, but so it has also in all the Polyphaga, and this character can only be used to distinguish them from the Adephaga, perhaps not even from all of these.

No one has yet suggested that the Paussidæ should rank as the highest of all the Coleoptera; their adephagous affinities are too apparent for that. Yet in this family we find the basal sternites of the abdomen fused together, the nervous system concentrated, and, in some of the genera, the sutures of the prothorax almost completely vanished, and the epimera meeting together behind the prosternal process. If we had the external morphology of the body alone to guide us, how should we be enabled to say that the genus *Paussus* belongs to the lowest and most primitive of all the groups of Coleoptera? That conclusion was arrived at first by a study of its wing-venation, and has since been confirmed by a knowledge of the structure of the sexual organs. External morphology does also, it is true, bear it out, for in the lower genera of the family there is, I find, a quite distinct suture between the pleuræ and the notum resembling completely the one met with in all other families of Adephaga.

That the Rhynchophora are a very highly organized and greatly modified group of the Coleoptera no one now seems to question; but their position in a phylogenetic scheme of classification depends not so much upon their own high organization as upon the origin of the Phytophaga, the group from which they have presumably been derived. This is a matter which Kolbe has not nearly so fully discussed. He agrees with

Lameere that the Prionidæ are the most primitive of the Phytophaga, and in the genus *Parandra* they recognize the form which they consider to be the most primitive of all. This genus has a considerable resemblance in general form and in the structure of the antennæ to the *Passandrini* and other Cucujidæ, which they look upon as the most primitive of the Clavicornia.

In Ganglbauer's opinion, *Parandra* is by no means the most primitive but rather a considerably modified form of the Prionidæ, and its resemblance to the Passandrini he attributes to convergence resulting from a similarity in habits of life, a view with which I quite concur.

Not less significant than the resemblance in the form and structure of the antennæ between *Parandra* and the Passandrini is, I think, the fact that the antennæ are frequently strongly serrate, pectinate, or flabellate, in many of the lower and less specialized genera of Longicorns, and only rarely so in those of the higher groups of the same family.

But while it is true, as Kolbe points out, that the brush-like sole and crypto-pentamerous condition of the tarsi characteristic of the Phytophaga is met with also in some of the Clavicornia, no great significance need be attached to that fact. It is only in the more modified forms of each group that the resemblance is very great. In many genera of Elateridæ and Cleridæ, and in some Dascilloidea, the fourth tarsal joint is as much reduced in size as it is generally in the Phytophaga.

In endeavouring to trace back the origin of the Longicorns, wing-venation does not greatly help us. Its least modified condition in this family is to be found in the Lepturini and Philini, and here its resemblance to that of the Clavicornia and Heteromera is tolerably close, and does not preclude the supposition that these groups and the Longicorns may have had the same or very closely related ancestors. On the other hand, it is just as close, perhaps even more so, to that of the Dascilloidea, a group which takes us back still nearer to the Malacoderms.

But whatever may be the correct view as to the origin of the Phytophaga, the question still remains, Did they or did they not originate at an earlier date than the Lamellicornia? Ganglbauer believes they did; but against his view, which certainly has some strong points in its favour, we have to consider the simple pentamerous condition of the tarsi in the Lamellicornia, the separation of the sternites and pleuræ of the second and third abdominal segments, the lesser number of the Malpighian vessels, and also what appears to be the less specialized structure of the larvæ in this group. The last point is of little importance; larvæ are subject to many secondary modifications, and the Lamellicorn larvæ are in some respects perhaps even more modified than those of the Longicorns. But the other points are significant, and seem to favour the view that the

Lamellicornia are an older group than the Phytophaga. It is possible, however, to hold this view without going so far as Kolbe, who finds a relationship between the Lamellicornia and the Staphylinoidea, and classes them together in the same first division of the Polyphaga. He agrees with Ganglbauer that the wing-venation of the Staphylinoidea has been derived directly from the Adephagan type. He must, I think, be prepared to maintain that the wing-venation of the Synteliidæ and Lamellicornia has also been derived directly from that type, for otherwise there would be a difficulty in accepting his classification.

(To be continued.)

LEPIDOPTERA IN WEST SUFFOLK.

By Lt.-Colonel C. G. Nurse, F.E.S.

It is more than thirty-five years since I first, as a schoolboy, began to collect Lepidoptera in this county, and it is only within the last few years that, on the conclusion of my Indian service, I have been able to return as a resident to my old collecting ground. During the past five years, except for an interval of about fifteen months spent in India, I have devoted the greater part of my time to collecting insects in this neighbourhood. I have paid attention more particularly to Lepidoptera and Hymenoptera, but have also made collections of Diptera and a few Neuroptera. In the present paper I propose to give some account of the less common Lepidoptera I have met with, together with a few remarks on the absence of some generally common and conspicuous insects.

This locality does not appear to be a good one for butterflies, and although I am out almost every fine day, and my collecting ground extends more or less for a radius of ten miles from my house, I have come across only twenty-seven species, including a specimen of *Colias edusa*, seen but not captured. I think this is a very meagre total for about four seasons' collecting. The absence of several more or less common species may be mentioned. I have not seen a specimen of *Pararge egeria*, *Vanessa polychloros*, *Pyrameis cardui*, nor a single "fritillary," although *Argynnis euphrosyne* used to occur in a wood where I have recently sought for it in vain.

Some of the larger moths also seem to be much less common than they used to be. I have not recently come across *Sphinx ligustri*, either in the larval or imago stage, though I used to meet with it frequently thirty years ago. I have already, on page 94 of the 'Entomologist' for the current year, given an account of my experiences with the Sesiidæ; I may add, however, that although in some localities here *Sesia vespiformis* and *S. culiciformis* are common enough in the larval stage, I have only once observed the former in the imago stage, and the only imagines I have seen of the latter were those I bred. One may thus easily understand how the species of this genus are generally considered rare until their life-history is known, and special search made for the larva or pupa. I have taken several larvæ and pupæ of *Cerura furcula* and *C. bifida*, but have not met with *Dicranura vinula* in any stage. I beat a single larva of *Stauropus fagi* at West Stow, in the same locality where Mr. Wratislaw obtained it forty years ago, but the insect must be very rare in West Suffolk.

Several Notodontidæ occur, the best being perhaps *Pheosia dictæoides*. Every year I obtain a few pupæ of *Palimpsestis octogesima*; on one occasion I found five pupæ at a single Lombardy poplar, but usually I get only three or four each season. The absence of *Cosmotriche potatoria* is somewhat remarkable; I have not once come across the conspicuous larva of this usually common insect. I obtained, by beating, a few larvæ of *Hylophila prasinana* and *H. bicolorana*, and duly bred specimens.

Many of the trees in this neighbourhood show signs of the ravages of *Cossus ligniperda*, but the imago is difficult enough to obtain, and the only specimen I have added to my collection came to light in the house of a relative. I have noticed that trees that have been struck by lightning are frequently attacked, and almost invariably on the side of the damage. I have only once come across the imago of *Zeuzera pyrina*, but on several occasions, when investigating a branch that showed the working of a larva probably belonging to this species, I have found that a woodpecker had been before me.

Of the less common Noctuidæ, in addition to such local species as *Emmelia trabealis*, I obtained the following:—*Craniophora ligustri*, bred and taken at sugar; *Leucania straminea*, common in the larval stage at Ampton; *Nonagria dissoluta* and var. *arundineta*, both forms bred; *Noctua ditrapezium*,* four at sugar and one at light; *Xanthia citrago*, common in the larval stage; *X. aurago*, one bred from a larva beaten at Ampton. I found larvæ and pupæ of *Hydræcia micacea* common in dock roots, but professional collectors, in the shape of moles, had in many cases been before me, and I found it useless to investigate any root, even if honeycombed with the work of the larva, when the ground near it showed signs of the recent work of a mole.

I obtained a number of Geometridæ, including of course the local *Acidalia rubiginata*, *Anticlea berberata*, and *A. sinuata*, &c. Perhaps the best insect of this family was a single specimen of *Eupithecia irriguata*, at rest on an oak-trunk. Other Eupithecids were *E. lariceata*, *E. tenuiata*, and *E. dodoneata*. Of the last species I got several pupæ under hawthorn bark, and following up the clue, beat larvæ from the same trees later on. From remarks in Barrett's book I rather expected to find the larva on

Quercus ilex, but, although there was a tree of this kind in the midst of hawthorns on which the larvæ of *dodoneata* occurred, I quite failed to get any larvæ on the *ilex* except a few of *Hybernia marginaria*.

Pyrausta ostrinalis occurs commonly between Elveden and Barnham. One specimen of *Pionea margaritalis* was trodden up at Tuddenham, but I searched in vain for larvæ later on. A few larvæ of *Oxyptilus distans* were swept from a species of *Crepis*, and I found occasional specimens in the imago stage in widely separated localities. Larvæ of *Aciptilia galactodactyla* were common on burdock, and I got a single *A. tetradactyla* on Newmarket Heath.

Chilo phragmitellus seems to occur in all the reed-beds here, and a nice series was bred. Two specimens of *Schœnobius forficellus* were trodden up in the daytime on the edge of a pond at Barnham, and I caught a single *S. gigantellus* at Ampton. *Nephopteryx spissicella* was not uncommon at Ampton and West Stow, and I bred a very dark form of *Rhodophæa advenella*. *Homœosoma sinuella* was fairly common, and the thistle feeders, *H. nebulella* and *H. binævella*, were also obtained.

In 1910 I paid a good deal of attention to Tortrices, and among those obtained were:—*Leptogramma literana*, one at West Stow; *Peronea aspersana*,* two at Newmarket; *Sciaphila hybridana*, at Timworth; *Antithesia salicella*, Ampton and West Stow; *Retinia pinicolana*, in numbers at Ampton; *R. turionana*,* one caught at Ampton, and two bred; *Pædisca semifuscana*,* and *P. rubiginosana*,* one of each at Tuddenham; *Carpocapsa nimbana*,* single specimens at West Stow and Livermere; *Asthena pygmæana*,* common at Troston, and also occurs less commonly among spruce fir at other places in the neighbourhood; *Stigmonota perlepidana*,* common at Ampton and Timworth; *Aphelia osseana*,* common at Newmarket.

Of the Psychidæ, I found cases of *Fumea intermediella* not uncommon at Ampton and West Stow, but all the imagines that resulted, except one, were females. From a case of *Talæporia pseudobombycella* found on a beech-trunk at Ampton I duly bred the moth.

The only Tineid new to Suffolk that I obtained was *Stenolochia gemmella*,* from Culford. Other species were *Adela rufimitrella*, Ampton and Timworth; *Cerostoma sequella* and *Depressaria hypericella*, bred; *Lemnatophila phryganella*, two at Ampton; and a nice series of *Orthotælia sparganiella* bred from larvæ and pupæ found in a pond at Barnham.

All the insects obtained at Newmarket were caught within the Suffolk boundary. I have to thank the editor, Mr. Richard South, for kindly determining for me many of the smaller and less easily identified species. Those marked * are new to Suffolk.

Timworth Hall, Bury St. Edmunds: April 9th, 1911.

CONVERSAZIONE OF THE ENTOMOLOGICAL SOCIETY OF LONDON.

The Entomological Society is to be congratulated on having secured the Linnean Society's rooms in Burlington House for the second Conversazione, which took place on the evening of Wednesday, May 17th. The Library is admirably suited for the display of exhibits; and the Lecture Room for the Addresses, delivered on this occasion by Professor E. B. Poulton, F.R.S., on "Recent Discoveries in Insect Mimicry," and by Mr. F. Enock, F.E.S., on "The Tiger Beetle (*Cicindela campestris*)," both of them receiving a hearty welcome from large audiences, to whom the many and excellent lantern slides were an additional delight.

Upstairs the exhibitions were arranged in such a way as to be seen to the best advantage; perhaps the most attractive being the Hon. N. C. Rothschild's and Dr. Karl Jordan's model of the Tropical Plague Flea (*Xenopsylla cheopis*), showing that insect about the size of a well-fed cat! The same two Fellows also brought from Tring exceptionally instructive cases of Gynandromorphs and Papilionidæ from New Guinea. Mimicry so much under discussion at the present moment, was objectively presented in the exhibits contributed by Lord Avebury, F.R.S.; Professor E. B. Poulton, F.R.S.; Mr. C. A. Wiggins; Dr. W. A. Lamborn; and Mr. E. G. Joseph, respectively; Mr. H. Eltringham's beautiful drawings for the plates of his 'African Mimetic Butterflies' supplying a further insight into the mysteries of the several groups screened by him; while presented with the exquisite finish and delicacy we associate with all his work were Mr. Enock's series of photomicrographs of new species of British Mymaridæ. Other extremely popular exhibits were Mr. W. C. Crawley's and Mr. H. St. J. K. Donisthorpe's observation nests of British ants with guests, the latter showing also cases illustrative of ants and myrmecophilous insects, and myrmecophilous Acari and Coccidæ under the microscope; and Miss Fountaine's magnificent collection of bred *Charaxes*. In the "living" department may be noticed Mr. G. R. Baldock's "Stick Insects," born and bred in this country from an Indian parent, and the many examples of larvæ and pupæ of British Lepidoptera brought by Mr. L. W. Newman. But to our disappointment, especially at a time when so much is being heard on the subject of economic entomology, exhibits of the applied science were conspicuous only by their absence—Mr. F. W. L. Sladen's Living Workers of his British Golden Bee being the only item of the kind in an otherwise quite sufficiently well-filled list.

From the short space at our disposal we have been compelled, of course, to omit a number of hardly less interesting exhibitions than those mentioned. We must record, however, our pleasure and thanks to the Linnean Society for the fine case of "Relics of Linnæus"—books, medals, MSS., field equipment and the like—and to Professor Selwyn Image, whose "Old Entomological Books" gave us an opportunity of comparing the artistic genius of the "Aurelian" fathers, by no means to their disadvantage, with the latest products of pen, pencil, and process! Fellows and guests were received at the head of the staircase by the Rev. F. D. Morice, President, and the Rev. George Wheeler, Secretary, and Mrs. Wheeler; while to the Hon. Secretary of the Committee, to Mr. Stanley Edwards, Mr. R. Adkin, and those other Fellows immediately responsible for the success of the Conversazione we offer our sincerest congratulations. At the same time we venture to hope that more Fellows will support the next gathering, especially from among the younger ranks of the Society.

H. R.-B.

BY THE WAY.

The thanks of all naturalists are due to Mr. A. E. Shipley, F.R.S., for his efforts to defeat the appropriation of a part of the grounds of the Natural History Museum, in Cromwell Road, by the Science Museum. A Memorial has recently been presented to the Cabinet by Mr. Runciman, proposing the erection of a new Spirit-Building upon ground, to be alienated for that purpose, belonging to the Natural History Department, to the north of the Museum. The present Spirit-Building, with its fittings, has cost over £30,000; but Sir Henry Roscoe, one of the principal signatories of the alienation Memorial, appears to think it inadequate, and would consider as "a national disaster" any action which prevents the erection of a new one "on the proposed site." Mr. Shipley's counter Memorial most correctly emphasizes the fact that to restrict the expansion of the already overcrowded Natural History Museum would be no less disastrous. How immediate is the need for this expansion is best illustrated by the galleries and high wall-shelves already placed in the Insect "Room," the contents of which are among the smallest objects preserved. What then must be the condition of the Palæontological Section, where the objects reach the opposite extreme of size, when, as Mr. Shipley truly points out, "more gigantic species . . . are being discovered by expeditions at present in the field"? We must unite to repel all such encroachments.

Every provincial entomologist, it may be presumed, has some interest in the museum of his particular town or county. Yet this interest is by no means forcibly exemplified when visiting any such establishments. A year or two ago we looked over most of the Yorkshire museums—Leeds, Dewsbury, Bradford, Huddersfield, York, &c.—and the result was distinctly disappointing, except in the case of the first-named, where the economics were well though scantily exhibited; the others all contained some insects, though—whether Britishers caught in the building or exotics acquired from the Himalayas and Brazil—unnamed. We have not heard that our note to the 'Yorkshire Post' has effected amelioration. In the Eastern Counties things are but little better and, with the exception of the fine exhibits at Cambridge, nothing but Lepidoptera and Coleoptera are to be found. The Rev. J. H. Hocking and Mr. Skepper presented the former, respectively, to Ipswich and Bury St. Edmunds; the collection of the latter at Ipswich was purchased some years ago, and we had the pleasure of presenting the Bury lot. Norwich possesses a comprehensive show of beetles (the collection of old Robert Scales, the friend of William Kirby, we believe) and the magnificent parasitic and aculeate Hymenoptera amassed by John Bridgman during the "eighties." Colchester and Lowestoft lag, and Yarmouth's quaint museum boasts few insects.

Students of local distribution would do well to investigate the often neglected contents of all our local museums (those of the Isle of Wight Museum at Newport were in a deplorable condition when we last saw them). The task should not be onerous; specialists are more numerous now than twenty years ago. Local entomologists, though rarely the Curators themselves, would be competent to report adequately upon the extent and condition of their own orders. These should be tabulated against the name of each museum, and a Regular Register kept by a Standing Committee of recorders, to whom local authorities would find it to their own advantage to notify the more important accessions. Thus geographical distributionists would find a wide and hitherto almost unexplored field for investigation, which would add considerably to the perfection of local catalogues. Scientifically it is conceded by all (but the institutions themselves) to be useless for provincial museums to store up any but local exhibits—types should go to the National Collection—and it is quite certainly in working out the productions of their own county, or peculiar geological formation, that these museums in the future will most materially assist the general scientist.

C. M.

NOTES AND OBSERVATIONS.

HYBERNATION (?) OF PYRAMEIS ATALANTA.—The references in this month's 'Entomologist' to the hybernation of *Pyrameis atalanta* remind me that I received, on January 14th last, a lively example, which had been rescued from a dog belonging to Mr. Morris, of Leigh-on-Sea. Where the dog found the butterfly is not known, but, considering the rough treatment the latter must have received, its condition was surprisingly good.—F. G. WHITTLE; 7, Marine Avenue, Southend, May 7th, 1911.

Scarcity of Pyrameis atalanta in 1910.—I can fully confirm Mr. L. W. Newman's remark (*antea*, p. 100) on the scarcity of *P. atalanta* last season. I can only recall to mind seeing one specimen on the wing (early in October), and 1910 is the first year out of twenty that I have missed finding *atalanta* larvæ, although I frequently searched for them.—F. W. Frohawk.

Lophopteryx carmelita in North Lancashire.—I reared a fine female of *N. carmelita* on May 2nd, 1911, from larvæ taken in July, 1910, off birch on mosses not very far from Lake Windermere.—Thomas Baynes ; 70, Sunderland Terrace, Ulverston, Lancashire.

Surrey Orthoptera.—Mr. E. J. Burgess-Sopp sends me a short addition to my list (*antea*, p. 51) :—*Labia minor*, Farnham district; not uncommon. *Chorthipphus elegans*, Tilford and Hale. *Gomphocerus maculatus*, Frensham and Farnham Commons; common. *Leptophyes punctatissima*, Farnham district, Tilford, Frensham. *Pholidoptera griseo-aptera* (= *cinereus*), Hale. *Tetrix bipunctatus*, Farnham district generally. *Metrioptera brachyptera*, Frensham Heath (one).—W. J. Lucas.

Mamestra persicariæ in Scotland.—In 'Moths of the British Isles' (vol. i. p. 240), I see it stated that *M. persicariæ* is only doubtfully recorded from Scotland. It may, therefore, be of interest to state that I took a specimen in fine condition off ragwort on the Morayshire coast, some twenty miles from here, the end of last August, and also saw another, which, having emerged earlier, was in too poor condition to take.—(Capt.) H. Holmes-Tarn ; The Lodge, Craigellachie, N.B., May 12th, 1911.

Note on Larvæ of Merodon equestris.—It may be of some interest to your readers to record the occurrence in England of the larvæ of the "narcissus fly," *Merodon equestris*, in bulbs of *Habroanthus pratensis* and *Vallota purpurea*, during the past winter. The fly has been hatched out from the former in this Laboratory, and is now in the British Museum. Hitherto the grub has been looked upon only as a pest of *Narcissus*, but this makes it evident that it can attack and destroy other bulbs as well. The Rev. W. Wilks, of Shirley, Croydon, tells me he has found the grubs in lily-bulbs.—Fred. J. Chittenden, Director ; The Laboratory, Royal Hort. Soc. Gardens, Wisley, Ripley, Surrey.

Lepidoptera at Light in Isle of Wight. — On May 18th I obtained at street-lamps here *Lophopteryx camelina*, *Notodonta trepida*, *Drymonia chaonia*, *D. trimacula* (*dodonea*), and *Pheosia tremula* (*dictæa*).—G. Nobbs ; E. Cowes, Isle of Wight, May 24th, 1911.

Plusia moneta at Reading.—My first capture of the above at Reading was July 13th, 1901 ('Entomologist,' vol. xxxiv. p. 255). Also see 'Entomologist,' vol. xxxvii. p. 214 and vol. xxxviii. p. 281. Since those dates I have taken the species as follows :—1906, June 14th, larvæ full-grown; June 28th, imagines. 1908, May 28th, mature larvæ; June 28th, imagines. 1909, May 31st, full-grown larvæ. 1910, May 29th, full-grown larvæ. 1911, May 2nd, very small larvæ. All the above were obtained in my own garden. My son has taken larvæ in a garden about a mile from here, this year.—W. E. Butler; Hayling House, Oxford Road, Reading, May 14th, 1911.

Plusia moneta.—In reply to C. Nicholson's enquiry respecting this species in "Notes" of last month, I am glad to report my acquaintance with this species. In 1906, I was living in a village near Luton and a friend with whom I worked informed me of having found some larvæ. I searched some monkshood and delphinium in some friends' gardens and discovered larvæ, which I reared. In 1907 and 1908 I obtained several larvæ. In the latter year I left for Letchworth, Herts, bringing some plants of monkshood with me. I am glad to say, that in 1910 and the present year, the larvæ have been found in my garden on the above plants, which appear to be the only pabulum selected in this district. I may add I have not seen any monkshood in any other garden but my own here.—Rev. E. Everett; "Ashleigh,' Broughton Hill, Letchworth, May 23rd, 1911.

Plusia moneta in Wales.—I took my first specimen of *P. moneta* in the garden here, at the end of June, 1906. In 1908 I visited some monkshood (*Aconitum napellus*) growing on the banks of the Ely River, some six miles from Llandaff, and found the moth had well established itself, as I took twenty-six specimens in two nights. In 1909 I took sixteen specimens in one night. Last week I visited the spot to see if I could find the caterpillar, and took twenty-two in little over an hour's time by beating the food-plant. The ground on which I found the larvæ has been flooded several times this winter with two or three feet of water, so that their being under water for a considerable time does not kill them. I have little doubt that the moth has spread through Wales wherever its food-plant is found in plenty.—E. U. David; Yscallog, Llandaff, May 17th, 1911.

Larva of Vanessa antiopa.—Respecting the Rev. Claxton's note (*antea*, p. 184), I have looked up the record in the 'Ent. Mo. Mag.,' vol. vii. p. 109 (which is obviously the one he remembers reading), and should like to point out the fact that it refers to a larva of *V. antiopa* which Mr. Stainton found on August 10th, 1870, at Andermatt, *not Scotland*; it therefore does not "supply the needed authentic instance," as Mr. Claxton suggests. I still maintain there is no proof of the larva having ever been found in a wild state in Britain, which may be owing to this species probably not migrating to this country in the spring, only doing so after its emergence in the summer abroad, and like its near relative *V. polychloros* and other Vanessidæ which have but a single emergence yearly, not pairing until after hybernation, when the specimens are too scarce and widely scattered over this country to find each other for pairing in the spring. I may here take the opportunity of correcting a slight error which occurred in my previous note, *viz.* 1892 should read 1902.—F. W. Frohawk; May, 1911.

Chrysophanus dispar—a Memory.—Information relative to the former haunts of our lost "Large Copper" is interesting, but perhaps readers of the 'Entomologist' may not be aware that in the "twenties" and "thirties" of the nineteenth century *Papilio machaon* was regarded as almost as great a rarity. In this connection I venture to quote the 'Reminiscences of the late Albert Pell, sometime M.P. for South Leicestershire,' edited by Thomas Mackay (John Murray, 1908), as follows:—" When Whittlesea Mere was bright with water, one family of gipsies made a living by capturing for collectors the 'swallow tail,' a very rare and beautiful butterfly that fluttered among its reeds and sedges, also the large copper butterfly equally rare. So it was in my young days; but now all is gone—reeds, sedges, the glittering water, the butterflies, the gipsies, ... and in its place, as the result of an enormous and unprofitable outlay, a dreary flat of black arable land. . . ." By a curious coincidence, it was at Pinner Hill, Middlesex, the house occupied by the Pell family of the previous generation, and then almost as remote in the country as the fens themselves, that I discovered in a case the three examples of *C. dispar* which I believe to have come from Benacre in Suffolk, as recorded by me elsewhere. Mr. Albert Pell was not only a great agriculturist, but also a close observer of bird life and a keen fisherman. — H. Rowland-Brown; Oxhey Grove, Harrow Weald, May 20th, 1911.

Varietal Names.—In the report of the sale of part of the collection of the late Mr. J. W. Tutt (Entom. May 1911, 185), Mr. Adkin asks why so little interest was manifested in the many named varieties. To me the answer is obvious. With the exception of perhaps half a dozen British lepidopterists who are interested in the matter, no one uses such varietal names as *nigrorubida*, *ochrea*, *flavorufa*, *intermedia*, *minor*, &c., nor cares anything whatever about them. In the case of a strongly marked variation, where the whole *facies* of the insect is altered, such as in the var. *deschangei* of *S. lubricipeda*; *varleyata*, *nigrosparsata*, and *lacticolor* of *A. grossulariata*; *doubledayaria* of *A. betularia*, and many others which at once occur to one's mind, a varietal name is not only advisable but necessary; but that a slight shade of colour, an extra spot, or the widening or contracting of a band, should entail the special naming of forms differing so slightly from the type is absurd. The craze for such name-making has caused a good deal of ridicule among lepidopterists generally.—Geo. T. Porritt; Huddersfield, May 6th, 1911.

Gloucestershire Lepidoptera.—Referring to my note on species new to the county in the 'Entomologist' (*antea*, p. 155), I can now add the following to my list:—*Pyrausta* (*Botys*) *fuscalis*, taken in the Forest of Dean among *Melampyrum* on June 23rd, 1910; *Schreckensteinia* (*Chrysocoris*) *festaliella*, taken in a wood on the outskirts of the Forest of Dean on April 13th, 14th, and 20th, 1911; *Phalonia* (*Argyrolepia*) *cnicana*, taken on the Cotswolds on July 1st, 1909; *Coleophora murinipennella*, taken on the Cotswolds on May 17th, 1910; *Mompha* (*Laverna*) *ochraceella*, netted near Gloucester on July 16th, 1909, and also on the Cotswolds on July 21st, 1910; *Limnœcia* (*Laverna*) *phragmitella*, captured at dusk on the bank of the River Severn, near Gloucester, on July 23rd, 1905; *Elachista* *gleichenella*, taken on the wing in the afternoon sunshine on the Cotswolds on July 8th, 1909, and July 7th, 1910; *Lithocolletis cerasicolella*, taken in the Forest of Dean on May 18th, 1907; *L. pyrivorella*, bred in May, 1905, from mined apple-leaf found in my garden. —C. Granville Clutterbuck, F.E.S.; Heathside, Heathville Road, Gloucester, April 22nd, 1911.

Breeding Trochilium apiformis.—I never attempted to breed this species but once, and then I was most successful by adopting the following plan: Having found, in the middle of February, 1875, twenty-two cocoons at the base of *Populus nigra* trunks, near Cambridge, I procured a large flower-pot, and half filled it with small broken pieces of another flower-pot. I then placed about three inches of loose mould on the top, and buried the cocoons perpendicularly in it, leaving them about a quarter of an inch above the surface. Of course, to be sure that I had placed them heads uppermost I had to make a small opening at one end of each cocoon, but this did not disturb the larvæ apparently, as the small opening was speedily closed again. I then covered them with a good thickness of loose moss, which was taken out, saturated with water, the superfluous moisture squeezed out, and the moss replaced; this was done about once a week. A piece of coarse muslin was tied over the pot-mouth, and the pot placed on two bricks (to allow a thorough draught) in an outhouse with the open window facing east to catch the morning sun. Between June 8th and 13th inclusive, from these twenty-two cocoons I bred twenty-two *apiforme*! nineteen perfect and three more or less crippled.—A. Thurnall; Wanstead.

Query respecting Sesia sphegiformis. — When walking the other day through a large wood in the Midlands, where "felling" was going on, I noticed that many of the birch-trees (from six to nine inches in diameter) were bored by, evidently, the larva of a Sesiid. As *S. sphegiformis* occurs in this wood, I concluded that the borings were made by the larvæ of this insect, but on closer examination I found that there was apparently no emergence hole through the side of the tree at the top end of the burrow, and that consequently emergence must have taken place through the entrance hole, as in the case of *T. bembeciformis* and *S. andrenæformis*. Unfortunately I could find none but old burrows, probably because of the age of the trees. Can any of your readers help me to elucidate the matter? *S. sphegiformis* is said to attack birch as well as alder. The late Miss Ormerod wrote: "The attack of the Alder Clearwing has long been known on the Continent as injurious to both birch and alder." But *S. sphegiformis*, so far as my experience goes, always emerges from the top end of its burrow, which for that purpose it diverts from the central portion of the stem up which it has fed. If therefore the burrows I saw were made by *S. sphegiformis*, its habit when feeding in birch differs from when feeding in alder, possibly because of the thickness of the birch bark, or possibly because of the amount of sap which the inner bark of birch always contains and which might drown the larvæ. If the work I saw was not done by *S. sphegiformis*, what other larvæ could be responsible for it?—Percy C. Reid; Feering Bury, Kelvedon, May 20th, 1911.

Trochilium crabroniformis.—There is something almost uncanny in the way the larva of this species behaves towards the end of its larva hood, and just when it is preparing for its exit into the world as a moth. That it does leave a cap of thin bark over the exit-hole is a matter beyond dispute; I have seen hundreds of them. No doubt it requires a sharp eye, and even the finger-tips have sometimes detected these caps when the eye had failed to discern them. And behind this cap the burrow is horizontal for half an inch, more or less according to the thickness of the infested stump, then it ascends for about four inches, and at the top of this tube a light cocoon is spun, and the change to a pupa effected. Now, as this final bore is always left clean and free of frass for the passage of the pupa towards the open air, one is inclined to ask, "What has become of the excavated materials"? It is all dumped in the burrow below the level of the horizontal cut, and is used to prevent the pupa from falling down the old well, so to speak (on its way towards the exit), where of course, if it did go down, it would be sure to perish. But it is not actual excreta that is thus used for stopping—it might go bad, get mouldy, and give trouble. An examination of this material shows that it consists of splinters of wood, which could never have been passed through the creature's economy; it is evidently bitten off for the purpose for which it is used. I have opened many of these tunnelings, and hatched out the perfect insects; there were a few failures at first until I studied the conditions more closely, and then I began to see what was wrong. Often it will be observed on opening a cocoon that the enclosed pupa is covered with beads of condensed moisture; it looks, in fact, as if it were sweating profusely, which just means that the pupa is much colder than the surrounding atmosphere, although it, too, must be cool, not to say cold, when you consider it is in the heart of a sallow stump near the ground, shaded by the bush itself and the surrounding herbage. So keep the pupæ in a cold room or outhouse with no sunshine near them, and lying on the surface of some damp moss, but don't cover them with moss; provide means for reaching a position from which the wings can hang whilst developing, but over and above all that *don't* by any means cut out your pupæ until a day or two before the time when they hatch out under natural conditions in your district. Here, in Renfrewshire, the average date of hatching in a wild state is the last week of June and the first few days of July. I cut out these pupæ when I want them about June 23rd to the 25th, keep them cool, and now I rarely have a misfire. The pupa should be of a dark orange colour inclining to blackness almost when ripe for removing, and rather hard to the touch; if a pale straw colour and rather soft, it's a "moral" it will die, so it is best to leave all such in their natural state, closing up carefully the damaged burrow, and leaving it for at least a week or ten days, when it may be examined again. Mr. Carter and Lt.-Colonel Nurse might try these methods with *T. apiformis*; I have never had this species in pupa, as it does not occur in this district, but as the two species have evidently much in common, the treatment might prove successful.—A. M. Stewart; 38, Ferguslie, Paisley, N.B.

SOCIETIES.

The South London Entomological and Natural History Society.—*April 13th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Miss Alderoon, F.E.S., of Worksop, was elected a member.—Mr. Ashdown exhibited about one hundred species of conspicuous coleoptera taken by him in Switzerland during July, 1910.—Mr. Turner, living specimens of *Agapanthia asphodelas*, sent to him by Dr. Chapman from Hyères.—Mr. Adkin, an undetermined Agrotid from the Isle of Lewis, a *Sciaphila* from Unst, probably referable to *S. colquhounana*, and a *Pyrameis cardui* in which the row of spots on the hind wings were united into an irregular blotch.—Mr. Newman, on behalf of Mr. Oliver, a bred series of *Aphantopus hyperanthus* which had emerged in January and February. The larvæ had fed all the winter on *Poa annua.*—Mr. Hemming, series of *Brenthis selene* from Warwick and Sussex; the former were a much larger race in both sexes.

April 27th, 1911.—The President in the chair.—Mr. P. A. Buxton, of Tonbridge, was elected a member.—Mr. Tonge exhibited a pupa case of *Ægeria andrenæformis* as found *in sitû*, projecting from the burrow after the emergence of the imago. He had found four such cases in nature.—Mr. Kaye, a similar exhibit with the living imago which had emerged in confinement, and a fine plant of the Mexican orchid, *Cattleya citrina*, in flower.—Mr. R. Adkin, a remarkable gynandrous specimen of *Bombyx quercus*, with left antenna and wings male and right antenna and wings female, but of the male colour. It was from the Capper collection.—Mr. Newman, a larva of *Callimorpha dominula*, black in colour without the yellow markings.—Mr. Andrews, two examples of the recently identified dipteron *Hilaria aëronctha* from North Kent.—Mr. St. Aubyn, photographs of Lepidoptera at rest.—Mr. Gough, a dwarf example of *Celastrina argiolus*.—Messrs. Edwards and Turner, several species of *Papilio* from North America, from the *machaon* and *glaucus* groups.—Mr. A. E. Gibbs gave an account of the arrangements for the South Eastern Union of Scientific Societies Congress at St. Albans in June.—Mr. Dennis showed lantern slides of lichens and flowers.—Mr. Main showed a series of lantern slides illustrating his observations on the life-history of the common myriapod.—Hy. J. Turner, *Hon. Rep. Secretary*.

City of London Entomological Society.—*April 4th*, 1911.—Mr. H. M. Edelsten exhibited series of *Noctua baia* and *Cidaria immanata* taken in Epping Forest in July, 1910, at rush blossom, on an occasion when sugar failed to attract Lepidoptera.

April 18th, 1911.—Mr. Huggins, two specimens of *Abraxas grossulariata*, with black nervures on hind wings. He also exhibited a somewhat dark example of *Ennomos alniaria* from Gravesend, and stated that the species seemed to be getting gradually darker in that district.—Mr. J. Riches, fifteen bred specimens of *Macrothylacia rubi*, all that emerged from a brood of about forty larvæ.—Mr. V. E. Shaw, a long series of *Triphæna comes* bred August, 1903, ex Findhorn ova, including vars. *clarkii*, *nigrescens*, *pallida*, *rufescens*, and *curtisii*, and also forms intermediate between *clarkii-nigrescens* and *pallida-rufescens*.

May 2nd, 1911.—Mr. G. R. Baldock exhibited a series of *Triphæna pronuba* from Galley Hill, Essex, 1910, dark forms predominating, many specimens showing almost unicolorous blackish brown superiors.—Mr. P. H. Tautz, long series from Pinner, Studland Bay, and Hampstead; those from Pinner included many with grey costal streak, while the Dorset specimens included many very red examples and one with straw-coloured inferiors.—Mr. J. E. Gardner exhibited a number of Lepidoptera from Exmoor, taken August, 1911, including *Xylophasia scolopacina*, common at ragwort: *Toxocampa craccæ*, *Asthena blomeri*, *Abraxas ulmata*, *Cidaria populata*, and a number of "micros," in which latter group of Lepidoptera the district appeared to the exhibitor to be particularly rich.—Mr. G. H. Heath, dark *Gnophos obscurata*, *Cleora glabraria*, and *Cidaria silaceata*, Exmoor. —Mr. L. W. Newman, a series of hybrid males ex *Nyssia zonaria* female and *Biston hirtaria* male; also hybrid females with narrow pointed wings, ex *Nyssia zonaria* male and *Biston hirtaria* female; he also showed *Smerinthus populi* var. *pallida*, and a female suffused with pink; also a fine gynandromorph, one side typical male and the other pink form of female; the body showed both colours evenly divided, and the legs corresponded in colour to that side of the body on which they were situated.—Mr. C. P. Pickett, *Angerona prunaria*, showing response to environment: pale larvæ fed under white muslin, darker reddish larvæ ex pink muslin sleeves, and still darker forms ex red sleeves.

May 16th, 1911—Mr. B. S. Williams exhibited two examples of *Luperina gueneei*, the type form and one of var. *murrayi*, from St. Anne's-on-Sea.—Mr. A. W. Mera, imagines of *Endromis versicolor* that had gone through two winters in the pupal stage.—S. J. Bell, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—Meeting of the Society held at the Royal Institution, Colquit St., Liverpool, March 21st, 1911.—Dr. P. F. Tinne, Vice President, in the chair.—Mr. G. H. Watson, of Manchester, gave a lecture on "The Saturniidæ, a Group of Wild Silk Moths." After reviewing the classification of the group, the lecturer detailed the work that is being done by himself and others in order to discover new sources of supply of silk and also to strengthen the races of silk-producing moths cultivated in Europe and Asia. The true silk moth is not known as a wild insect, although in China there are records of its cultivation upwards of 4000 years old. Occasionally disease ravages the inbred races of the insect, hence the necessity to introduce new blood. So far hybridisation has not been very successful, thus the efforts of practical entomologists are directed towards finding out and investigating new species of wild moths whose larvæ make a cocoon of serviceable silk.—Mr. Watson showed the Japanese silk moth, *Antherea yama-mai*, and also the Tussor, or Indian, silk moth, *A. mylitta*, as instances of wild insects capable of culture and yielding a large quantity of valuable silk; *Saturnia pyretorum*, the moth whose larva yields the gut used for fishing lines, the production of which forms the staple industry in the Island of Hainan (China), also came in for attention. The lecture was illustrated by Mr. Watson's collection of twenty large drawers containing many very rare species arranged with the silk they produce, the whole forming an educational exhibit of exceeding interest.

The concluding meeting of the session was held on April 9th, Mr. Geo. Arnold, Vice President, in the chair.—Mr. Wm. Mansbridge gave an address on *Grapholitha nævana* and *G.* (? var.) *geminana*, in which he dealt with the various forms of these insects in Lancashire and Yorkshire. He stated that in the West Riding the two species were in the imago state at the same time in localities near to one another, where the holly form (*nævana*) and the bilberry form (*geminana*) occurred. At Delamere however the bilberry feeder was worn at the time the holly feeder was beginning to emerge in the district around Liverpool. Although *nævana* from holly had a variation like *geminana*, it was never so pale as the latter, and the moth from bilberry was always smaller in size; *geminana* did not possess a black variation like *nævana*, but a very small percentage were unicolorous dark grey.—Mr. F. N. Pierce then described the results of his examination of the genitalia of the two species; after critically comparing a long series of preparations of both males and females he had failed to distinguish any point of difference. In discussion by the members it was held that the negative character of Mr. Pierce's results was not sufficient, in this instance, to sink *geminana* to the level of a variation of *nævana*.—Mr. Wm. Mansbridge exhibited a long series of *Selenia bilunaria*, comprising very dark speckled forms, and a new variation of a uniform dark ferruginous brown colour for which he proposed the varietal name *brunnearia*. Mr. C. E. Stott showed a specimen of *Panchlora nivea*, L., an exotic cockroach, taken on the wing at Trentham, North Stafford, in October, 1910.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

RECENT LITERATURE.

Fossil Insects and a Crustacean from Florissant, Colorado. By T. D. A. COCKERELL. (Author's edition, extracted from 'Bulletin' of the American Museum of Natural History. Vol. xxviii. art. xxv. pp. 275–288. New York: October 19th, 1910.)

INCLUDES descriptions of two new species of Trichoptera, four of Hymenoptera, and six of Diptera.

The Thorax of the Hymenoptera. By ROBERT EVANS SNODGRASS. No. 1774. From the 'Proceedings' of the United States National Museum. Vol. xxxix. Pp. 37–91, with plates 1–16. Published October 25th, 1910.

IN this paper the external morphology of the thorax of the nonaculeate Hymenoptera is discussed and illustrated. As we understand the author, classification should not be based on thoracic structure alone, but on a study of the structure of all the parts of the body. Any system of taxinomy or phylogeny, he states, must be founded on a consideration of all the characters of all the forms concerned.

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SOME ASIATIC BEES OF THE GENUS *ANTHOPHORA*.

By T. D. A. Cockerell.

Anthophora caldwelli, Cockerell.

Foochow, China (H. R. Caldwell). U. S. National Museum. Formerly confused with *A. zonata*. The female has very bright greenish-blue bands, clypeus with a reversed yellow T, hind basitarsus with a good deal of white hair.

Anthophora calceifera, Cockerell.

Foochow, China (H. R. Caldwell). U. S. National Museum. Formerly confused with *A. zonata*. This species was described from Formosa. A male from Foochow differs from the type in having the lateral marks on clypeus somewhat smaller, and the abdominal bands all pale green. The fifth ventral segment of the male abdomen is emarginate in *A. caldwelli*, but has a straight edge in *A. calceifera*.

Anthophora zonata (Linnæus).

Foochow, China (H. R. Caldwell). One female. Trong, Lower Siam (Dr. W. L. Abbott). U. S. National Museum. The male from Trong agrees with *A. zonata* from Formosa; the four females differ much in size and in the tint of the abdominal bands, one large one has the bands a beautiful emerald-green. It seems improbable that there are two species here, but if there are, the males are needed for their satisfactory separation.

Anthophora zonata stantoni, new subspecies or variety.

♀. Length about 12 mm.; light face-markings formed as usual, but yellow; hair of thorax above orange-fulvous mixed with black; abdominal bands very brilliant, the first two greenish, the other two light blue; hind tibiæ with hair on outer side pale fulvous, on inner black; hind basitarsi with much white hair on outer side; wings dusky; tegulæ dull ferruginous; eyes clear yellowish-green.

Hab. Manila, Philippine Islands (W. A. Stanton). U. S. National Museum. The male may show that this is a distinct species, perhaps nearer to *caldwelli* than to *zonata*. The abdominal bands are essentially as in true *zonata*, not at all as in *whiteheadi*. Lepeletier says of female *zonata* that the hind tibiæ have the hair on outer side longitudinally divided into black and white; some of the Siamese examples show this very well, but the Manila insect lacks this character, though it has a streak of black hair running down from the knee-plate. A closely related form is *A. zonata andrewsi* from Java and Borneo; it differs typically in the abdominal bands being yellowish-green, with coppery tints, but intermediate forms may occur. The hair on the hind tibiæ in *andrewsi* is as in *stantoni*.

Anthophora superans, Walker.

I have one of Walker's cotypes, labelled "Gebel Musa, Mt. Sinai." It is a male, and probably Walker's description was taken from this sex, although it is stated to represent a female. The species closely resembles *A. garrula*, but the first abdominal segment is entirely covered with fulvous hair, indicating an approach to *A. harmalæ*. The following characters are significant:—

Length about 18 mm., expanse about 28; pubescence fulvous; hair of head and thorax above without dark hairs intermixed; hair on inner side of hind basitarsi warm dark red; wings dusky hyaline; second s. m. exceedingly broad below, receiving first r. n. about middle; b. n. meeting t. m.; *face-markings pale yellow*, including front of scape broadly, the usual supraclypeal mark, lateral face-marks filling space between clypeus and eye, clypeus (without any black lateral marks, though lower margin is narrowly fusco-ferruginous as usual), labrum (with a small pellucid spot at each upper corner), and greater part of mandibles; labrum considerably broader than long; third antennal joint fully as long as the next two combined; flagellum very dark reddish beneath; middle tarsi long, but not otherwise peculiar; end of abdomen emarginate, hardly bidentate; abdominal hair-bands broad, entirely fulvous.

Anthophora quadrifasciata xerophila, new subspecies.

♀. Length almost 16 mm.; similar to *quadrifasciata*, except as follows: hair of head and thorax above pale ochreous; abdomen with four broad pure white bands; face-markings white; black lateral marks on clypeus smaller, not much broader than the interval between them; all the hair on first abdominal segment white. Very close indeed to *A. persicorum*, Cockerell, but a little larger, antennæ as far as third joint (rest missing) black, legs black, hind spurs black. The hair of hind basitarsus is entirely black, but the middle basitarsus has a large tuft of white occupying the basal half posteriorly. This runs exactly to *A. quadrifasciata* in Friese's tables.

Hab. Karachi, N.W. India, September, 1909; two females (E. Comber). British Museum. The wings are certainly no darker than in *quadrifasciata*; they are distinctly darker in *persicorum*.

Anthophora delicata, n. sp.

♂. Length about 10 mm.; flagellum about 4½ mm.; black, including legs and antennæ; pubescence pure white, except on head and thorax above (including tubercles), where it is warm pale ochreous, of a very delicate and beautiful tint, on the middle of mesothorax and anterior part of scutellum with fuscous hairs intermixed; hair on inner side of middle and hind tibiæ and tarsi black, on inner side of anterior tarsi red; hind tibiæ with pure white hair on outer side; hind basitarsi with hair all black except a small white tuft at base; middle basitarsi covered with white hair on outer side; spurs black; antennæ long; third joint shorter than fifth, fourth broader than long; face-markings light canary-yellow, including clypeus (with only a little black on each side above), a small supraclypeal mark (but no lateral marks), labrum (with a pair of elongate small basal spots), and mandibles except apex; labrum a little broader than long; eyes red; face narrow, densely covered with white hair; wings hyaline, with a glaucous tint, nervures piceous; second s. m. narrow, receiving first r. n. much beyond middle; b. n. falling a considerable distance short of t. m.; abdomen with five broad white hair-bands, first segment hairy all over, but thinly on disc, so that it appears grey; apex broadly emarginate, subdentate.

♀. Similar, but larger and more robust, length about 12 mm.; face-markings similar, except that the black marks at sides of clypeus above are large, leaving a large triangular yellow interval between them, shining and irregularly punctured; flagellum dark red beneath except at base; third antennal joint as long as the next three together, fourth extremely short; hair of hind basitarsus black, with a basal white tuft on outer side; hair of middle tibia with a rufous apical patch; wings brownish. The abdomen of one specimen carries two pollen-bodies of an asclepiad.

Hab. Karachi, N.W. India, September, 1909 (E. Comber). British Museum. In Friese's tables the female runs to *A. velocissima* and the male to *A. nigricornis*.

The following key will separate the allied species:—

Spurs rufo-testaceous; male clypeus with anterior margin and a median stripe light (Quetta) . *picicornis*, Fedtschenko.
Spurs black . . . . 1.
1. Hind femora of male incrassate; hind basitarsi of female white haired with black apical tuft (Quetta) *velocissima*, Fedtschenko.
Hind femora of male not incrassate . . . . . . 2.
2. Nervures red-brown; face-markings ivory-white *nigricornis*, Morawitz.
Nervures piceous; face-markings yellow . . *delicata*, Ckll.

The male is the type.

Anthophora niveocincta, Smith.

This species was described by Smith from a specimen in the Baly collection, and consequently the type is not in the British Museum. Bingham quotes the original description, adding that he has not recognized the species. Smith merely cited "India" as the locality, but Dours describes both sexes from Pondichery, and places the insect as a variety (subspecies) of *A. albigena*. Mr. E. Comber has obtained both sexes in some numbers at Karachi, N.W. India; also a female at Hyderabad, and a male (October, 1909) at Lyallpur. Dours cites *A. calens*, Lepeletier, described from Africa, as the same species, but this is certainly not correct. Friese states that he does not know *calens*, but I have one from F. Smith's collection which seems to be correctly named, though the marginal hair-bands on the first three abdominal segments are fulvous, on the following two dull white. This, however, is a male, whereas Lepeletier describes a female, readily accounting for the difference. The insect is of course quite close to *niveocincta*, yet evidently distinct. *A. niveocincta* is the Indian (tropical) representative of *A. albigena*, or more especially of the closely related species or race, *A. savignyi*, Lepeletier. The female *niveocincta*, compared with *albigena*, differs thus: flagellum chestnut-red beneath; scape usually with a yellow mark; labrum longer in proportion to its breadth; face-markings strongly yellow, median band of clypeus broader; fifth abdominal segment with more white hair. Nurse reports true *albigena* from Quetta. *A. ruficornis*, Sichel in Dours, supposed to be a variety of *A. niveocincta*, is doubtless a distinct species, known by its entirely red antennæ in the female.

Anthophora camelorum, n. n.

Anthophora ruficornis, Fedtschenko, Turkest. Apid. i. p. 35, 1875. (Not Sichel in Dours, 1869.) Visits *Alhagi camelorum*, Fischer.

Anthophora albigena quadrata, new subspecies.

♂. Length about 9 mm.; differing from *A. niveocincta* as follows: face-markings creamy-white (as in *albigena*); labrum comparatively broad and short (as in *albigena*); flagellum black; hair of head and thorax above very pale ochreous, strongly mixed with black, producing a dull grey effect; abdominal hair-bands thinner. This is almost the same as *albigena*, but the clypeus has a pair of large quadrate black patches, emarginate below, their inner sides converging, but not closely approaching, above. The hind basitarsus is black-haired, with a tuft of white at base. End of abdomen bidentate.

Hab. Nasik, N.W. India (E. Comber). British Museum. *P. salviæ*, Morawitz, is similar but larger, with the scape all black, whereas in our insect it carries a large cuneiform white mark. The face-markings of *salviæ* are yellow, more in the manner of *niveocincta*.

Anthophora (*niveocincta* variety ?) *amolita*, n. sp.

♂. Exactly like *A. niveocincta*, except as follows: flagellum black, dark chestnut beneath; third antennal joint much longer and more slender, fourth about as long as broad; black marks on clypeus (which do not noticeably diverge below) long, leaving only a narrow apical band. The labrum is fully as long as broad.

Hab. Karachi, N.W. India (E. Comber). British Museum. The third antennal joint is about 432 μ long (272 in *niveocincta*). This is probably distinct, but only one specimen is known.

The following key separates the species collected by Mr. Comber in N.W. India, related to *A. quadrifasciata* and *albigena*:—

Females . . . . . 1.
Males . . . . . . 3.
1. Large; hair on fifth abdominal segment white only at sides; sides of face densely covered with white hair, but no lateral face-marks . *quadrifasciata xerophila*, Ckll.
Smaller; fifth abdominal segment with hair white, except a black median apical patch; flagellum ferruginous beneath . . . . 2.
2. Larger; inner edges of black marks on clypeus widely diverging below; no lateral face-marks . *delicata*, Ckll.
Smaller; inner edges of black marks on clypeus parallel or nearly; lateral face-marks present . . *niveocincta*, Sm.
3. Flagellum bright ferruginous beneath; face-marks yellow; scape with a yellow band or stripe in front *niveocincta*, Sm.
Flagellum dark, at most (*amolita*) dark chestnut beneath . 4.
4. Scape all black; flagellum long; dark marks on clypeus much reduced . . . . . . *delicata*, Ckll.
Scape with a light band or stripe . . . . . . 5.
5. Labrum conspicuously broader than long; antennæ shorter; face-marks creamy-white; apical light band of clypeus very broad . . . . . *albigena quadrata*, Ckll.
Labrum about as broad as long; antennæ longer; face-marks yellow; apical light band of clypeus very narrow *amolita*, Ckll.

University of Colorado, Boulder: May, 1911.

NOTES ON THE DRAGONFLY SEASON OF 1910.

By F. W. & H. Campion.

The poor summer of last year afforded us very few opportunities for collecting Odonata. However, a few of the captures and observations which were made appear to be worth recording, as do also some of the experiences of our friend Mr. H. J. Watts, to whom we are indebted for the Gloucestershire specimens which we shall mention, as well as for some other records.

Sympetrum striolatum was taken at the Black Pond, Surrey; Reculver, Kent; and Staines, Middlesex: *S. sanguineum*, both sexes, at Wisley, Surrey (Mr. Watts): and *S. scoticum* at the Black Pond. *Libellula depressa* occurred at Hartford, Hunts (J. Peck, June 14th), and at Burnham Beeches, Bucks (June 19th), and *L. quadrimaculata* at Burnham Beeches (June 19th), and Holme, Hunts (June 20th). A few more males of *L. fulva* were obtained near Huntingdon on June 23rd, 25th, and 28th. All of them agreed with each other and with the single male taken in 1909 in having the basal spot on the hind wing strongly developed. In most of the specimens apical brown spots were present on the fore wings alone, although one of them, probably older than the rest, had similar spots on the hind wings also. All were fully matured; but one, with fore wings considerably frayed, retained the immature fulvous coloration of the principal nervures. The specimens were all of good size, the smallest of them being 44 mm. in length, and 75·5 mm. in alar expanse, and the maximum measurements obtainable from the series being 48 mm. for length, and 81·5 mm. for expanse. All but one of these males exhibited the copulation-marks to which Dr. F. Ris has recently called attention, that is, the rubbing away of the blue powder from segment five, or segments five and six, through the female clinging with her spiny feet to that region of the male abdomen during copulation, which in this species is a protracted operation.

The most interesting event which came to our knowledge during the year was the occurrence of *Somatochlora metallica* in Surrey. It will be remembered that as recently as 1908 the species was found, for the first time in England, in a part of Sussex. On June 26th, 1910, Mr. Watts took a fine male in a Surrey locality, and subsequently handed it to us for examination. The abdomen was stouter than that of the two Sussex specimens kindly given to us by Mr. E. R. Speyer, and resembled more nearly in this respect Mr. J. J. F. X. King's Scottish specimens. A few individuals were seen by ourselves at the same place on one or two days in August, but another capture could not be effected. Notwithstanding the close general resemblance subsisting between *S. metallica* and *Cordulia ænea*, we were quite satisfied that the scarcer insect was the one seen on the occasions in question. When flying in brilliant sunshine, *metallica* looked distinctly golden, and altogether unlike the other species. Moreover, whenever it appeared about the level of the water, some of the Agrioninæ teeming there were sure to dart towards it, a movement which obviously caused it annoyance. This curious conduct towards *metallica* on the part of smaller dragonflies was observed also by Mr. Speyer in Sussex, but we have never noticed anything of the kind in the case of *C. ænea* during our long acquaintance with that insect in Epping Forest.

A single male of *Gomphus vulgatissimus* was taken by Mr. Watts at Eynsham, near Oxford, on June 16th.

A female of *Brachytron hafniense* (= *B. pratense*) was procured at Ramsey (Hunts) on June 21st. [In July, 1897, an exceptionally late date for the species, a very fine female occurred to Mr. K. J. Morton at Monkswood, in the same county.] *Æschna mixta*, Mr. Watts informed us, was met with again at Pulborough, Sussex; a few males were taken by ourselves at Staines (October 2nd), and the species was also observed at the same place on October 16th. A male of *Æ. cyanea*, taken at Ealing on September 28th, was given to us by Mr. Charles C. Smith. On June 27th it was found that a male nymph of *Æ. grandis*, obtained at Burnham Beeches by Mr. H. F. Ashby (June 19th), and kept indoors, had already disclosed the imago. The species was seen in flight at the Black Pond on September 13th, and at Staines on October 2nd.

Calopteryx splendens, as usual, was flying in numbers over the River Ouse, near Huntingdon, during June. An interesting male taken on the 25th of that month had the right fore wing considerably reduced in size, and the venation of the apical area in a very aberrant condition.

Both of the British species of Lestinæ were met with, *Lestes dryas*, in teneral condition, near Ramsey, on June 21st, and *L. sponsa* at Byfleet, Surrey, on July 24th and August 4th and 7th.

Specimens of *Platycnemis pennipes* were obtained at Wolvercote, Gloucestershire, on June 17th. *Erythromma naias* was taken at Staines (May 22nd), Lechlade, Gloucestershire (June 15th), Wolvercote (June 17th), Holme (June 20th), and Byfleet (August 7th); and *Pyrrhosoma nymphula* at Staines, Lechlade (including the female var. *fulvipes*), Burnham Beeches, Holme, Ramsey, and Byfleet.

Ischnura elegans occurred at Staines, Lechlade, Wolvercote, Holme, Ramsey, Hartford, and Byfleet. Immature specimens were plentiful at Hartford on June 25th and August 1st, and others were met with at Byfleet as late as August 7th. At Byfleet (August 4th) a male had larval water-mites on the under surface of segments four, five, six, and seven; in the case of segments six and seven the mites had lodged themselves in the ventral canal and caused a considerable distension of the abdomen. At the same place (August 7th) a male with an insect in its jaws was kept under observation for some little time; it was ultimately captured, and the prey found to be a small caddis-fly, which Mr. K. J. Morton was kind enough to determine for us as *Triænodes bicolor*. This observation was especially interesting, as being the first instance within our knowledge of an Odonate feeding upon one of the Trichoptera. On the same occasion evidence was obtained of *I. elegans* itself having fallen a victim to another predaceous animal, for a mutilated female of that species was found lying upon a growing leaf; the contents of the thorax had been entirely abstracted, but the abdomen was left intact. Var. *rufescens* occurred sparingly at Staines on June 12th, but was quite common at Hartford on August 1st. Specimens were also met with at Byfleet on August 7th; in one of them the black of segment nine had strongly invaded the blue of segment eight, and formed a large spot of symmetrical outline occupying the apical third of the segment; a little black from segment seven had also encroached upon segment eight basally. The form of the female known as *infuscans* was also present at Byfleet on the same date.

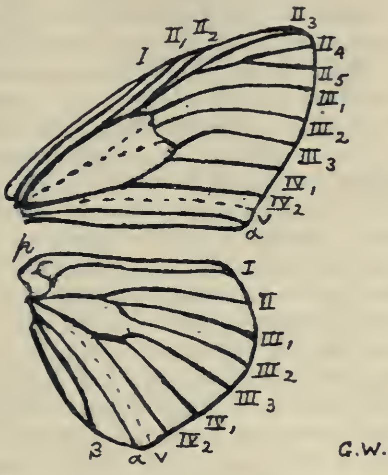
A large colony of *Agrion pulchellum*, reported to us by Mr. Watts in 1909, was met with at a stagnant pond at Staines on May 22nd. A living male was found there on June 12th entangled in a spider's web, from which, apparently, it was unable to escape. A remarkably small female was also taken; it measured only 32 mm. in length, and 40·5 mm. in expanse. At Holme (June 20th) a teneral female had a good-sized water-mite lodged on the inferior surface of the tibia of the right fore leg, an unusual situation for such a creature. As early as June 28th (Hartford) some specimens had their wings much frayed, and were obviously very old. Other localities which may be mentioned for the species are Wolvercote, Ramsey, and Byfleet. Localities recorded for *Agrion puella* were Staines, Lechlade, Burnham Beeches, Holme, Ramsey, Hartford, and Byfleet. A remarkable male from Gloucestershire, having the lateral branches of the U-shaped spot on segment two entirely separated from the transverse line, has been already mentioned in this magazine (vol. xliii. p. 331). Captures of *Enallagma cyathigerum* ranged from May 22nd (Staines) to September 13th (Black Pond); Lechlade, Wolvercote, and Holme were also among the places at which they were made. Teneral specimens were met with at Byfleet as late as August 4th, and the species was still emerging at the same place on August 7th. A male was obtained having the spot on segment two entirely disconnected from the posterior circlet (Byfleet, August 4th). On the same occasion a female, without an attendant male, was observed to be getting out of the water of the Basingstoke Canal with the aid of weeds floating on the surface. When taken, it proved to be a female of the straw-coloured form, and quickly resumed its normal appearance and activity. Blue females were obtained at Byfleet (August 7th) and the Black Pond (September 13th); the first-named specimens included one in which the antehumeral stripes and the prothoracic spots and border were distinctly brown.

58, Ranelagh Road, Ealing: May 13th, 1911.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA.*

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 13.)



The neuration of this group, and, indeed, of the whole genus, presents far more points of difference than could have been expected, and it has involved a prolonged study of the other two groups, as well as considerable excursions into the Argynnids and Brenthids. The accompanying diagram has been taken from var. *berisalensis*, and is drawn just twice the size of the original wing. I have, however, added, in dotted lines, the obsolete portions of nervure iii in the fore wing, and the nervure v in both wings, though these are quite invisible when the wing is flattened and mounted on card, as well as the indication of the cross nervule between iii_2 and iii_3 in the hind wing, though this is never present in *berisalensis*, because I shall have occasion to refer to them in treating of certain other species. I have used throughout the German nomenclature of Hoffmann, Spuler, and others, because all my notes had been made in this notation, and it can present no difficulty if accompanied by a diagram; and it has, moreover, the advantage of indicating the origin of the branch nervures, as may be seen from the neuration of the pupal wing.

With regard to the colour and texture of the nervures, it may be said generally that in the exclusively northern or mountain species they are much darker and coarser than in the others. This is peculiarly the case in those of another group—*cynthia*, *iduna*, and *merope*, but both the colour and texture of these is approached by *varia* and (making due allowance for its small size) *asteria*; *aurelia* also, though by no means exclusively a mountain species, approaches this group very closely, another indication of its nearness to *varia*. Next to these comes *dictynnoides*, also a more or less mountain species; whilst mountain *athalia* are darker than those of the plain, northern *parthenie* than Italian, and *berisalensis* than typical *deione*. The finest and lightest species are *dictynna*, *parthenie* (Italian), and *britomartis*, but, whilst *britomartis* looks somewhat thicker than *dictynna*, the nervures of the former are apt to melt away to some extent with the action of the chemicals used for removing the scales, in a way which I have not noticed in any other species. It may be remarked here that while superficially the resemblance between *asteria* and *merope* is sometimes very close, yet the neuration (especially with regard to the point of departure of ii_2 in the fore wing) connects the former definitely with the *athalia*-, and the latter as definitely with the *aurinia*-group; in the same way, the form of the discoidal cell of the hind wing shows that we are right in placing *deione* with this group rather than with the group typified by *cinxia*.

To take the nervures, so far as they are distinctive, one by one:—Fore wing: i does not really offer any distinction, always reaching the costa without any upward curve; for, though I have found one specimen of *athalia* in which it anastomoses with ii_1, and another in which it nearly does so, this seems to be due in both cases to the position of ii_1.

ii_1 runs almost absolutely parallel with i in *parthenie*, *dictynnoides*, *deione* (type), generally in *berisalensis*, and occasionally in *varia*; it approaches i very gradually and almost continuously in *asteria*, and generally in *varia*; in *aurelia* it approaches i very slightly and gradually, and turns equally slightly and gradually away again; in *dictynna* it approaches rapidly and turns off gradually; in *britomartis* its position is between that of *aurelia* and that of *dictynna*; in *athalia* it approaches more closely, generally much more closely, to i, sometimes to the point of actual anastomosis.

The point of departure of ii_1 from the main stem of ii varies in different specimens of the same species, but is generally somewhat further from the base in *athalia* than in others; *dictynna* is perhaps the most variable, but the branch is generally rather high up, sometimes close to the top corner of the discoidal cell, though sometimes rather low down; in *britomartis* the position is also variable, but is generally rather low down, and never, so far as I have seen, very high up.

ii_2–ii_5 offer no distinctive characters in this group.

Traces of the main stem of iii, with its first bifurcation about half-way up the cell, which are very distinct in *merope* ♀, are visible in this group in *asteria*, *parthenie*, and *dictynna*, and very slightly in *dictynnoides*. In *dictynna*, and possibly in *britomartis*, it would seem to have divided very near the base; but of the latter (in which, as a rule, it can scarcely be traced) I have one specimen, in which not merely a fold but an actual nervure (representing the main stem and the upper part of the primary fork) is visible, where the branch could only have sprung from quite near the outer edge of the discoidal cell. The outer (as opposed to the basal) ends of the primary fork are just visible at the secondary branching in northern *parthenie*, and in *aurelia* and *berisalensis* (the upper one only in the last two), and more conspicuously, as a rule, in *dictynna*, as well as in some species of both the other groups.

The four central cross nervules are really the secondary bifurcations of iii, and join iii_1 to iii_2, and iii_2 to iii_3.

iii_1 and iii_2 are more nearly parallel—*i. e.* nearer to *Dryas paphia*—in *britomartis* than in any other species of this group, though perhaps not more so than in *aurinia*, in which, however, they are much more curved. iii_1 springs from near the corner of the discoidal cell, the short cross nervule coming outwards from the base at a sharp angle, in *parthenie*, *deione*, *berisalensis*, and *dictynnoides*, and generally in *athalia* and *dictynna*; in *britomartis* the cross nervule is more nearly, and sometimes quite, at right angles with ii; in *asteria* and *varia* iii_1 springs from the corner of the cell or close to it, and almost as close in *aurelia*; this point of departure is also by no means unusual in *athalia* and *dictynna*.

iii_2 is basally very close to iii_1 in *asteria* and *aurelia*, less so in *deione*, rather farther away in *parthenie*, and still more so in *athalia* and *berisalensis*, more nearly parallel in *varia*, *dictynna*, and *dictynnoides*, most widely separated in *britomartis*; but it is impossible to base any conclusion whatever on this characteristic, as there is considerable variety in the matter in the specimens of each species.

iii_3 is perceptibly less curved at its basal end (even without a lens) in *aurelia* than in any other species; the curve is slightly more abrupt in *asteria*, *varia*, and *dictynna*, and less so in *deione*, *berisalensis*, and *britomartis*.

(To be continued.)

SOME NOTES ON MELANISM.

By A. M. Stewart.

Recently while passing along the edge of a small wood, in conversation with a gamekeeper friend, some remarks were passed on the occasional appearance of a black rabbit amongst those we saw around us. "Yes," my friend remarked, "wherever you see so many black ones you may depend upon it the stock is getting too much inbred. You see," he continued, "I have only a small bit of a place, and the way we are hemmed in here we can hardly prevent it, but I am getting some fresh stock down from the hills, and we will soon get rid of the black lot."

Here, to me, was a new theory for melanism—may it not apply to insects as well as to the larger animals? At least it is worth a little investigation and reflection.

As for example, take the case of the environs of Paisley. To the north of the town there were at one time—within the memory of those still living—large tracts of virgin woodland interspersed with pine and birch woods. Gradually the woods were cut down, the heather burned, the land drained, and now all, or nearly all, this extensive area is under crops. But, as remarked, not all—a very few small woods and moorland patches still remain. And here the insect and bird fauna peculiar to pine, heather and birch finds its last stronghold, huddled together no doubt they are—to the extinction of many species once recorded as frequent or common in the district. Small wonder, then, if inbreeding is rampant! In a small wood of scarcely ten acres, with two acres of heather attached—virtually a fox cover—surrounded by smiling cornfields, the heather and pine insects are veritably on an island.

And we *do* get quite a number of dark and black forms of a variety of species—*Thera variata*: eighty per cent. are dark, twenty per cent. are black, the type we rarely see. *Eupithecia castigata*, we get a perfectly black form; it was known at one time as the "Paisley pug." *Cidaria suffumata* var. *piceata* is very frequent, and the same may be said of one or two others confined in these restricted areas.

Take another illustration of the point. The August of 1909 I spent my holiday collecting in the north-east end of the Island of Arran. Now, there is no smoke or dirt there to support the theory of their influence, yet I found melanic forms of various species were common. In a long narrow rocky glen I came twice upon small patches of billberry, only a few clumps to each colony, and from each clump were disturbed several specimens of *C. populata*; they were all much darker than the typical form, and some of a unicolorous dark coffee colour. They never settled on the rocks. The formation here is a dark slate-coloured schist, with grey granite boulders in the burn, some of immense size, but *populata* always sought refuge by diving into the heather or bracken thirty or forty yards up or down stream. I did not meet with the species again until I struck the second patch of food-plant, and then the same performance was repeated. Inbreeding under these conditions was not only probable but hardly avoidable, when we remember that the females of *populata* scarcely fly at all, so badly are they equipped in the matter of wings.

How far these suggestions will stand after further investigations it is too early yet to say, but to those with the time and opportunity it opens up a new line of enquiry, which may lead to some tangible result. And after all is said and done as to the value of protective coloration in insects during the imago stage, it is really during the larval period that the greatest mortality occurs, and their enemies then are far more numerous. Ichneumons and birds, possibly, do the most damage in this respect. I once opened the stomach of a cuckoo shot amongst bilberry, and it was filled with the caterpillars of sawflies and Geometers, including one larva of the wood tiger—so that the ultimate shade of an imago is possibly of secondary importance. In the glen here referred to, *C. russata*, *Larentia cæsiata* and *L. olivata* were very numerous, and their greatest enemies in the imago stage were the spiders. One species of formidable size was common, and as their webs were always stretched across fissures and crannies of the rocks, their toll of insect life must have been considerable, but it would hardly be a protection to any moth to be a shade darker or lighter than its fellows once it came in contact with one of these webs, which had usually the owner sitting in the centre waiting for his or her next meal! Insect-feeding birds were rare—though a few large dragon-flies (*C. annulatus*) were hawking up and down the stream, but so far as my observation went they did not molest these moths, even when sent flying amongst them by the dozen.

In conclusion, I think Mr. Leigh is right when he says:—"There is probably some other factor at work in the production of melanic forms." And again: "It is of course quite probable that the dark colour of many species of moth *is* protective, while in others it may be of physiological importance, and associated in some way with constitutional hardiness," or, may I suggest? climatically hardy but reproductively a disadvantage.

Note.—The inbreeding of *Spilosoma lubricipeda* led to the production of the black form var. *radiata*.

38, Ferguslie, Paisley.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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(Continued from p. 219.)

In the Synteliidæ and Lamellicornia, the wing-venation is considerably modified, and by reduction of the veins it comes sometimes to look like that of the Staphylinoidea; but there is generally no difficulty in recognizing the hook-like connection which the anterior branch (M_1) of the media makes with the media, forming as it were a recurrent branch of the latter. It is scarcely probable that this character, which is the one most distinctive of the Cantharoidean type, has not been derived directly from that type, but derived instead directly and independently from the Adephagan type.

The larvæ of the Lamellicornia (those of the Synteliidæ are unknown) differ wholly in form and structure from those of the Staphylinoidea. The primitive segmentation of the abdomen which the Lamellicornia have in common with the Staphylinoidea—the character which seems to weigh most with Kolbe —is not confined amongst the Polyphaga to those two groups; it is a character also of the Malacoderms as a whole, and is met with as well in some of the lower forms of Teredilia, Dascilloidea, Sternoxia, and Heteromera. And in view of this fact, admitted by Kolbe himself, I do not understand why he has not included the Malacoderms in his division Haplogastra, unless, as I have said, he is prepared to maintain that the wing-venation has been differently derived in each of his two divisions of the Polyphaga.

In Lameere's classification the Staphylinoidea immediately follow the Lamellicornia in the linear arrangement, but that results from an entirely different view from Kolbe's, and is only because the Lamellicornia come as the highest and terminal group in his first division of the Polyphaga, while the Staphylinoidea constitute the whole of his second division.

Larval Form and Structure.—If further justification were needed for a division of the Coleoptera into the two suborders Adephaga and Polyphaga, it would be found in a study of the larvæ. The larvæ of the Adephaga differ from all other beetle larvæ in having one more segment to each leg,* which also usually terminates in two claws, whereas in the other larvæ it never has more than a single claw. They are not only distinct in structure from all other Coleopterous larvæ, but they appear also to be more primitive. In their general form, their active movements, and their possession of jointed anal appendages, they recall Campodea and other Thysanura. The structure of their mouth-parts differs less from that of the imagines than it does in other Coleopterous larvæ.

The larvæ of the Staphylinoidea also are active, Campodiform, and possessed of anal appendages resembling cerci, and,

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* The only exception known at present occurs in the Paussidæ. The first undoubted larva of this family was recently described by Dr. Böving. It has only five segments in each leg, as compared with the six present in other Adephagan larvæ. But its other characters point to its affinities with the Adephaga.

notwithstanding the lesser number of segments in the legs, have a great general resemblance to those of the Adephaga.

This resemblance is considered by Ganglbauer and Kolbe to indicate a relationship between the two groups, and is one of their reasons for placing the Staphylinoidea first in the suborder Polyphaga. It has been explained already that they regard the wing-venation of the Staphylinoidea as being derived directly from the Adephagan type, and that Lameere holds a different view. He believes that the resemblance between the larvæ of the Staphylinoidea and Adephaga has been brought about as the result of a convergence of characters, and is not to be attributed to any common inheritance. Nor does the Campodea-form of the Staphylinid larvæ appeal to him as a sign of their more primitive origin over that of the Cantharidiformes.

In consonance with his views upon the origin of metamorphosis in insects, Lameere holds that in insects with a complete metamorphosis the cruciform type of larva is more primitive than the Campodiform type, and therefore he does not admit the truth of Brauer's law when applied to these insects, although that law—namely, the nearer the larva is to the imago and to the ancestral form the more primitive is the type—does, he thinks, hold good in the case of the Heterometabola.

His views in this respect have left a marked influence on his classification. They explain to a great extent why he is so strong in maintaining the Cupedidæ as the most primitive family in the Adephaga, and in placing the Teredilia as the first and most primitive group in the suborder Polyphaga, although he has given other reasons also for adopting this course. There is, however, a mistake in one of his reasons for regarding the Cupedidæ as the most primitive of the Adephaga, namely, that the abdominal rings are *not* fused together as they are in the other Adephaga. It is precisely for this reason that the sternites and pleuræ of the second abdominal segment *are completely* fused with those of the third, that Ganglbauer considers the Cupedidæ to be one of the more modified families of Adephaga, and that Kolbe in his later classification removes them from that suborder, in which, excepting the Paussidæ, the second sternite is only partially fused with the third, being distinct from it at the sides of the abdomen.

As Ganglbauer points out, mistakes of this kind are apt to arise from the custom followed by systematists of referring to the first visible sternite of the abdomen as the first ventral segment, whereas it is actually in some cases the sternite of the second, in others of the third segment, or else represents the sternites of the two fused together. The sternite of the first segment has in most cases disappeared, leaving no trace behind.

The principal characters taken into consideration for the purposes of classification have now, I hope, been sufficiently discussed to enable the reader to understand how the main differences in the three classifications have arisen. The other differences, relating chiefly to the number of the families and groups to be recognized and the arrangement of the families in each group, are less essential, and can best be considered if we give the outlines of each classification first before pointing out and discussing those that seem to be the more important.

(To be continued.)

NON-HYBERNATION OF *PYRAMEIS ATALANTA*.

By F. W. Frohawk, M.B.O.U., F.E.S.

For many years past I have paid particular attention to the habits of *Pyrameis atalanta* in this country. My experience is based on careful observation and the life-history of this species under natural conditions.

I am of opinion that *P. atalanta* does not hybernate in the British Isles any more than *P. cardui* does, and that there is no authentic record of *atalanta* ever having been found hybernating anywhere in Britain, and surely if it did spend the winter months in such a state, so common a species would have been detected, when we know of several instances of the decidedly rare *Vanessa antiopa* having done so. I know of specimens of the latter which have from time to time been found during the winter months and early spring, and even of one seen on the wing in midwinter, but have never heard of *atalanta* after the first spell of cold weather in late autumn or early winter has set in, which I believe is fatal to the species. Therefore Mr. J. C. Warburg's views (*antea*, p. 183) on the subject are entirely contrary to my own, and I quite agree with Mr. L. W. Newman that *atalanta* does not hybernate in this country.

The occurrence of this species in Britain is due to immigration of specimens in the spring. Usually the eggs are not deposited until June, as the following notes will show, which may interest Mr. Warburg.

On June 10th, 1894, I captured a female which deposited about one hundred eggs on the 14th. On June 27th, 1903, I watched a wild female depositing on nettles at Wallasea, Essex, and two days later (June 29th) I saw another depositing at Hockley, Essex. At 6 p.m. on May 24th, 1909, I captured a female while at rest on the wall of a house (Rayleigh, Essex), sitting with expanded wings resting in the sun. A strong east wind was then blowing which had been continuous for several days. I have every reason to believe this was a freshly arrived immigrant. Not wanting the specimen I gave her a drink and set her free.

The complete transformations of the summer emergence of *atalanta* are of short duration, occupying in all about fifty days—the egg state nine days; larval state twenty-three days; pupal state seventeen days—total forty-nine days from the time the egg is laid to the emergence of the imago. These are the average periods, which are liable to vary somewhat according to temperature.

The butterflies of the summer brood pair and produce others, so that a succession of broods occur during the summer and autumn, which accounts for the larvæ in all stages occurring from about the middle or end of June until the middle of September, and fully grown larvæ during the early part of October.

May, 1911.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

By E. H. Strickland (Dip. S.E.A.C.).

(Continued from p. 204.)

Stegomyia tasmaniensis, n. sp.

Head with silvery scales round the eyes, remainder dark.

Thorax clothed with dark scales all over. Scutellar scales also all dark. Pleuræ and pro-thoracic lobes with silvery scales. Abdomen dark scaled with silvery lateral spots.

Legs dark, unbanded; silvery knee-spots on all femora, and silvery apical spot on all tibiæ. The last two hind tarsi, with part of the third, are of a dull white colour.

♀. Head clothed with flat scales, which are of a black colour, except round the posterior borders of the eyes, where they are white; and a few black upright forked scales at the back of the head. The proboscis and palpi are entirely covered with dark scales. Eyes dark brown. Clypeus black rugose. Mesothorax covered with blackish narrow curved scales with a slight brownish reflection. There are a few stout long bristles, especially about the wing roots. Scutellum with black flat scales, with a violaceous reflection, and strong posterior bristles to the lobes. Prothoracic lobes and pleuræ with silvery spindle-shaped scales. Abdomen with black flat scales, with a violaceous reflection; and with silvery apical lateral spots on all segments except the first two. Ventral surface of abdomen clothed with mixed white and dark scales, which are all white on the apical segment.

Legs with a white apical spot on all the femora and tibiæ. Fore and mid tarsi all dark, unbanded. Hind legs pale scaled on the inside along the entire length, last two hind tarsi, and part of third tarsus all dull white. Wings with brown scales, with a violaceous reflection. First fork cell long, slightly narrower than the second posterior, and its base considerable nearer the base of the wing; its stem about one-fifth its length. Supernumerary cross-vein slightly nearer base of wing than the mid cross-vein, posterior cross-vein about two and a half times its own length distant from the mid cross-vein.

Length 5 mm.

Habitat.—Tasmania.

Observations.—Described from four females, all rather damaged.

Genus Andersonia, nov. gen.

Head clothed in the centre with narrow curved and upright forked scales, and at the sides with flat scales as in *Culex*. Female palpi of four segments as in *Culicada.*

Thorax clothed on the greater part with narrow-curved scales, but on either side just before the wing-roots is a patch of flat and broad spindle-shaped, scales. Scutellum with narrow-curved scales. Abdomen with flat scales. Wing venation and scales similar to *Culicada.*

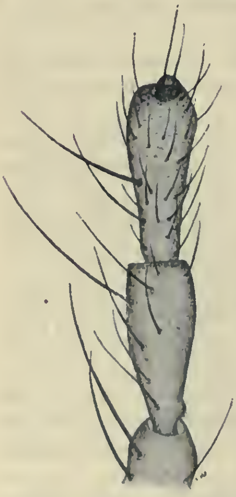
Male unknown.

One species only is known at present and is found in Tasmania.

This genus appears to be closely related to *Culicada*, from which, however, it can at once be separated by the presence of flat lateral scales on the thorax.

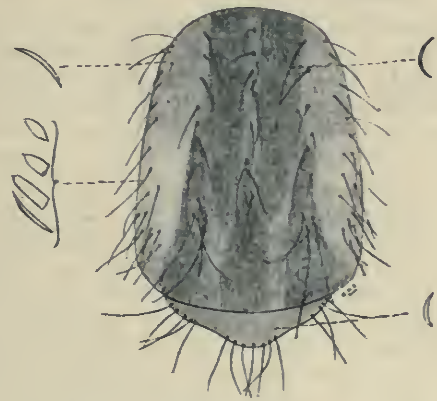
Andersonia tasmaniensis, n. sp.

♀. Head black, clothed with light golden small narrow curved scales, numerous similarly coloured upright forked scales, and cream coloured lateral flat scales. There are very few bristles on the head. Eyes bronzy. Antennæ with basal segment and basal half of second segment testaceous, the remainder dark. Palpi with very small fourth segment. somewhat densely scaled. Proboscis all dark in colour.



Female palp of *Andersonia tasmaniensis*, denuded of scales.

Thorax dark brown, clothed on the median area with small narrow curved scales, which are mainly of a dark brown colour; there is, however, a lighter median line of more golden brown scales on the apical three-quarters of the thorax; the basal quarter of the thorax is devoid of scales in the centre. There is, however, a narrow line of golden brown scales on either side of this area, bounded laterally by another small bare patch, which extends almost to the wing-root. The apical lateral third of the thorax is clothed with large golden yellow narrow curved scales, which lie with their apices toward the centre of the thorax. Just in front of, and extending to, the wing-roots is a very conspicuous patch of large creamy white, spindle-shaped, flat and elongated narrow-curved scales; the last-mentioned, together with similar coloured hairs, are most numerous basally near the wing-roots. There are three distinct rows of black bristles on the thorax besides lateral bristles and those which surround the wing-roots. The central row terminates at the commencement of the bare patch before the scutellum. Scutellum with light yellow narrow curved scales. Prothoracic lobes with light yellow narrow curved scales, and a few bristles. Pleuræ with creamy flat scales. Abdomen with flat scales. White basal lateral spots on all segments. This character does not appear to be quite constant, as in several specimens examined one or more spots were absent, while in two specimens there were traces of complete white basal bands on the second and third segments respectively. Ventral surface of abdomen white scaled. Wings densely clothed with brown *Culicada*-like scales. First fork cell narrower and considerably longer than the second posterior, its stem is not quite half its length. Supernumerary and mid cross-veins almost in a line, the former slightly nearer the wing base. Posterior cross-vein about its own length distant from the mid cross-vein.



Thorax of *Andersonia tasmaniensis*, n. sp.

Legs with femora, testaceous and clothed with mottled dark and light scales, replaced apically by a spot of ochreous scales. Tibiæ darker, but also mottled. Tarsi dark and all dark scaled.

Length 5·5–6·5 mm.

Habitat.—Tasmania.

Observations.—Described from eighteen females sent by Dr. Anderson. There were no males. The species is very distinctive, the sides of the thorax being distinctly lighter in colour than the median area, and in this it superficially resembles *Banksinella luteolateralis* (Theobald); the flat lateral scales, however, distinguish it at once from any other described genus.

South-Eastern Agricultural College, Wye.
November 22nd, 1910.

NOTES AND OBSERVATIONS.

Hippotion (Chærocampa) celerio at Birkenhead.—It may be of some interest to note that I saw, but did not unfortunately capture, a specimen of *C. celerio* in the garden yesterday evening at dusk. It was hovering over the flowers of lupin and other plants. I feel certain that I made no mistake, as the moth was within two feet of me, and I got a very good view of it.—Ralph Rylands; Highfields, Bidston Road, Birkenhead, June 12th, 1911.

Clytus arcuatus in North-East London.—A specimen of this beetle was found on a wall in Wick Road, Hackney, on June 10th. It was shown by Mr. J. O. Braithwaite, at the meeting of the North London Natural History Society, at Finsbury, on June 13th.—V. Gerrard; "Kenmore," Connaught Avenue, Chingford, Essex, June 24th, 1911.

Ægeria andrenæformis in Viburnum opulus.—On May 19th last I was agreeably surprised to find an old burrow of *Ægeria andrenæformis* in a branch of guelder rose (*Viburnum opulus*). On opening it I found it had produced an ichneumon! I have frequently searched *V. opulus* for signs of this species, but this is the only burrow I have detected. *V. lantana* is much more common than *V. opulus* in this district—Mid-Kent. Is *V. opulus* more often bored in localities where *V. lantana* does not so largely predominate?—P. P. Milman; Burham, near Rochester, June 16th, 1911.

Lepidoptera at Light in the Haslemere District. — On Monday night, June 5th, I took the following insects, on a white sheet placed in front of two acetylene lamps: *Stauropus fagi* (three males), *Palimpsestis fluctuosa*, and one example of *Drymonia trimacula* (*dodonea*). Some twenty other quite decent things were secured. Nearly everything turned up late as usual; the *S. fagi* did not appear until between 11.45 p.m. and 12.15 a.m. Mr. Norman Riley, of the South London Entomological Society, was with me at the time.—Bertram E. Jupp; Lyn Lodge, Camelsdale, Haslemere, June 16th, 1911.

Eristalis œstraceus, L., in North America (Diptera).—Several species of Syrphidæ are known to be common to Europe and North America, but an addition to the list of such species has been made by Mr. Ernest E. Austen (Ent. Mo. Mag. xxii. 2nd series, p. 63). When determining a female specimen of *Eristalis*, from East Prussia, recently presented to the National Collection by the Hon. N. C. Rothschild, Mr. Austen found that it was referable to *E. œstraceus*, L. At the same time he discovered that the specimen described by Walker, some sixty years ago, as *E. œstriformis* was specifically identical with *E. œstraceus*, L.

Chrysopa flava (Neuroptera).—In connection with Miss E. M. Alderson's paper (*antea*, p. 126) on this lacewing fly, the following records may be of interest for dates and localities. June 14th, 1896, one at the Black Pond, Esher Common, Surrey, by the side of its transparent filmy pupa-case; the wings were not fully expanded. July 1st, 1901, one received from Twickenham, Middlesex. June 7th, 1903, a large specimen taken while flying feebly in Surbiton, Surrey; probably it had not long emerged. June 21st, 1903, a specimen taken at Balham, London. June 21st, 1905, one taken at Horsley, Surrey. June 13th, 1907, one brought to me from Walton-on-Thames, Surrey. June 26th, 1909, one specimen, near Oxshott, Surrey. June 9th, 1910, an example taken from a fence in Fassett Road, Kingston-on-Thames, Surrey. June 12th, 1910, one taken at Claygate, Surrey. I have also two undated specimens from Macclesfield, Cheshire, given me by Mr. R. South.—W. J. LUCAS; Kingston-on-Thames.

A DIPTEROUS PARASITE BRED FROM IMAGO OF NYSSIA LAPPONARIA.—In April, 1909, amongst some females of *Nyssia lapponaria*, Bdv., from which I was hoping to obtain ova, I was surprised to find one, which had been able to walk about three days before, lying on its back and by its empty body the pupa of a dipterous parasite. From this the fly emerged twenty-two days later, and has been identified by Mr. C. J. Wainwright as a female of *Phryxe vulgaris* Fall. He has also been kind enough to tell me that, though it is an unusual event for an insect, parasitised in the larval stage, to develop fully, it is by no means unknown. But, if these flies have several broods, it seems to me possible that the egg was laid in the imago and that the whole oval and larval development of the fly took place in this stage. Females of *Nyssia lapponaria* almost always live more than a fortnight, and some of these parasites pass through their early stages much more quickly than this. Apart from the rarity of the occurrence, it has a further interest in that, so far as I know, it is the first recorded parasite bred from *Nyssia lapponaria* in this country.—E. A. COCKAYNE; 16, Cambridge Square, London.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, April 5th*, 1911.—The Rev. F. D. Morice, M.A., President, in the chair.—The following gentlemen were elected Fellows of the Society: Messrs. H. W. Davey, Inspector of the Department of Agriculture, Geelong, Victoria, Australia; H. Boileau, 90, rue de la Côte St. Thibault, Bois de Colombes, Seine, France; Rufus Mallinson, Oakland, Windermere.—The President announced the death of Mr. P. C. T. Snellen, of Rotterdam, the oldest Honorary Fellow of the Society, and moved that an expression of sympathy be forwarded to his family.—Mr. Robert Adkin exhibited, on behalf of Mr. Lachlan Gibb, of Montreal, Canada, three specimens (two males and one female) of a *Pieris* taken by Mr. Gibb at Lost River, Canada, in May, 1910, together with series of *P. oleracea* and *P. rapæ* from the same and other Canadian localities for comparison. Mr. Gibb mentioned that *P. rapæ* was not an indigenous species, but was said to have been introduced into Canada some sixty years ago, and had not only thoroughly established itself, but had become one of the commonest butterflies, whereas *P. oleracea*, an indigenous species, appeared to be rapidly declining in numbers, and it had been suggested that the introduced species was driving it out. He asked the opinion of the Fellows upon the three specimens, and suggested the possibility of their being the result of natural hybridisation between *P. oleracea* and *P. rapæ.*—Dr. Dixey was of opinion that the three specimens in question were certainly not hybrids, and even probably only a variety of *P. oleracea*; he pointed out that they differed less from the *P. oleracea* exhibited than did the series of *P. rapæ* from one another.—Mr. W. J. Lucas showed three specimens of *Euborellia mœsta*, Géné, received on April 3rd from Hyères, from Dr. Chapman, with four others of the same species. Both sexes were shown; but they look rather alike owing to there being little difference in the callipers. *E. mœsta* is quite black. There are just the rudiments of elytra, but no wings. Antennæ dark fuscous, legs partly so, partly black. Mr. Lucas also exhibited a large ant, one of three specimens found this year at Swanage in a bunch of bananas, supposed to have come from Jamaica. The President observed that the specimen belonged to the genus *Neoponera*, and was probably *N. theresiæ*, Ford, a Central American species. He added that the genus was a curious one, combining the possession of a sting with the single abdominal node characteristic of the stingless ants.—Mr. F. Muir exhibited two specimens of the bat *Miniopterus schreibersi*, with female *Ascodipteron* embedded at the base of the ear. He also showed specimens and enlarged drawings of the male, female, winged and wingless, larva and puparium of the *Ascodipteron*, and read the following note:—"These all came from Amboyna (Dutch East Indies). The male and winged female hatch out as normal imagines, the female, after finding her host, cuts her way under the skin at the base of the ear, and then casts her legs and wings; her abdomen then develops to an enormous extent, and entirely envelops her head and thorax so that she appears as a 'bottled-shaped' grub without legs or head. The larvæ develop in the uterus in the usual pupiparous manner, and when full grown pass out through the vagina and fall to the ground, where they immediately pupate, hatching out as imagines in about thirty to thirty-one days. This species I have named *Ascodipteron speiserianum*, after Dr. Paul Speiser, the authority on this group of flies. I took another species in North Queensland, living on the same species of bat."—Mr. L. W. Newman exhibited, on behalf of Mr. G. B. Oliver, of Wolverhampton, a series of *E. hyperanthus* bred during January and February, 1911, from ova laid by a Leamington female in July, 1910. The specimens, though rather small, showed a great tendency to produce large spots both on the upper and under side.—Mr. H. J. Turner exhibited living specimens of a longicorn beetle, *Agapanthia asphodeli*, sent by Dr. Chapman from Hyères.—Commander Walker observed that he had found it in Malta (the only common longicorn there), and also at Gibraltar in the early spring, and always on asphodel.—George Wheeler, *Hon. Sec.*

The South London Entomological and Natural History Society.—*May* 11*th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited a long series of *Aplecta nebulosa* and its varieties; a bred series from *robsoni* male and *thompsoni* female which did not conform to the anticipated Mendelian proportions. Twenty-six per cent. were grey, forty-two per cent. *robsoni*, and thirty-two per cent. *thompsoni*, instead of fifty per cent. *robsoni* and fifty per cent. *thompsoni*.—Messrs. R. Adkin, Harrison, Main, and L. W. Newman, hybrids of *Biston hirtaria* and *Nyssia zonaria*. It was stated that females had not yet been obtained in the cross *B. hirtaria* male and *N. zonaria* female. Mr. Adkin read detailed notes on the characteristics of the hybrid specimens shown by him.—Mr. Gough, specimens of the *arete* form of *Aphantopus hyperanthus* from Kent and Surrey, together with intermediate and type forms.—Mr. Hugh Main exhibited a living female scorpion just received from the West Indies; it had two young on its back where, it was stated, the parent deposited them and where they usually remained two or three weeks.—Mr. W. West (Greenwich) called attention to the Society's collection of Coleoptera, which had now been completely reset and cleaned, and to which Messrs. Ashby and Ashdown had recently made numerous additions.—Mr. H. Moore, some Coleoptera received alive from the Orange Free State.—Mr. R. Adkin, a bred series of *Nyssia zonaria* reared from Wallasey, and called attention to the laying over of numerous pupæ for two winters, and to the much paler general coloration of a number of the specimens.—Mr. Blenkarn, the coleopteron *Myrmedonia funesta* and the ant it cohabited with, *Formica fuliginosus*, from Sandown.—Hy. J. Turner, *Hon. Rep. Secretary.*

The Birmingham Natural History and Philosophical Society.—Entomological Section (late Birmingham Entomological Society).—*Jan.* 16*th*, 1911.—Mr. G. T. Bethune-Baker, President of the Section, in the chair.—The President referred to the great loss to entomological science by the death of Mr. J. W. Tutt. A vote of condolence with his family was passed, all members standing in their places.—Lepidoptera from Wicken Fen: Mr. Lloyd Chadwick exhibited *G. quercifolia*, *N. ziczac*, *N. dictæa*, *M. arundinis*, *M. flammea*, *C. phragmitellus*, *L. impudens*, *L. straminea*, *L. pallens* ab. *rufescens*, *C. senex*, *A. gemina* ab. *remissa*, *H. cribralis*, *T. hellmanni*, *H. auroraria*, *H. costæstrigalis*, *C. sparsata*, *C. lemnalis*, *N. cilialis*, *A. advena*, *P. festucæ*.—Lepidoptera from Cornwall and Devon: Dr. Beckworth Whitehouse exhibited *Polia nigrocincta*, *Dianthœcia barrettii*, *Heliothis peltigera*, *Epunda lichenea*, *E. nigra*, *Chariclea umbra*.—Lepidoptera from Henley-in-Arden: Mr. G. B. Manly exhibited *Trochilium bembeciformis*, *Drepana hamula*, *Xylophasia sublustris*, *Apamea ophiogramma*, *Hepialus sylvanus*, *Hybernia defoliaria*, *Himera pennaria*, *Trichiura cratægi*, *Notodonta dromedarius*, *Cirrhædia xerampelina*, *Cymatophora duplaris*, *Orthosia suspecta*, *Epunda lutulenta*, *Aplecta herbida*, *Tryphæna fimbria*.—Teratological specimens: Mr. G. T. Bethune-Baker exhibited the following: *Erebia melampus* with left hind wing short; *Melitæa athalia* with right hind wing short; *Erebia adyte* with right hind wing about half size; *Erebia ceto* without a head—the specimen was swept off a flower and possibly the head had been seized by a spider; the insect fluttered quite briskly nine hours afterwards.—Mr. G. T. Fountain exhibited *Cheimatobia boreata* taken under leaves during frost, November 20th, 1910.—Mr. H. Willoughby Ellis, specimens of the scarce beetle *Cathormiocerus socius* from the Isle of Wight, May, 1910.

Feb. 30*th*.—Mr. G. T. Bethune-Baker, President of the Section, in the chair.—Mr. W. Bowater exhibited hybrids *Zonaria* × *hirtaria* bred from Yorkshire larvæ sent by Mr. J. W. H. Harrison. Those bred from *Zonaria* male and *hirtaria* female were fertile and those from *Zonaria* female and *hirtaria* male were infertile. The hybrid females were semi-apterous.—Sir G. H. Kenrick gave a lecture on the Pierinæ butterflies, and explained the classification of the group. He described the various types of ova, larvæ, pupæ, and imagines, and also the food-plants and the structure of the antennæ and special scales occurring in certain species. The peculiar distribution and migration were explained, and the lecture was illustrated by a large series of specimens.—H. WILLOUGHBY ELLIS, F.Z.S., F.E.S., *Hon. Sec.*

RECENT LITERATURE.

A Handbook of the Tsetse-flies [*Genus Glossina*]. By ERNEST EDWARD AUSTEN, Assistant in the Department of Zoology, British Museum (Natural History). Pp. i–x, 1–110. Ten plates in colour. Printed by Order of the Trustees of the British Museum. 1911.

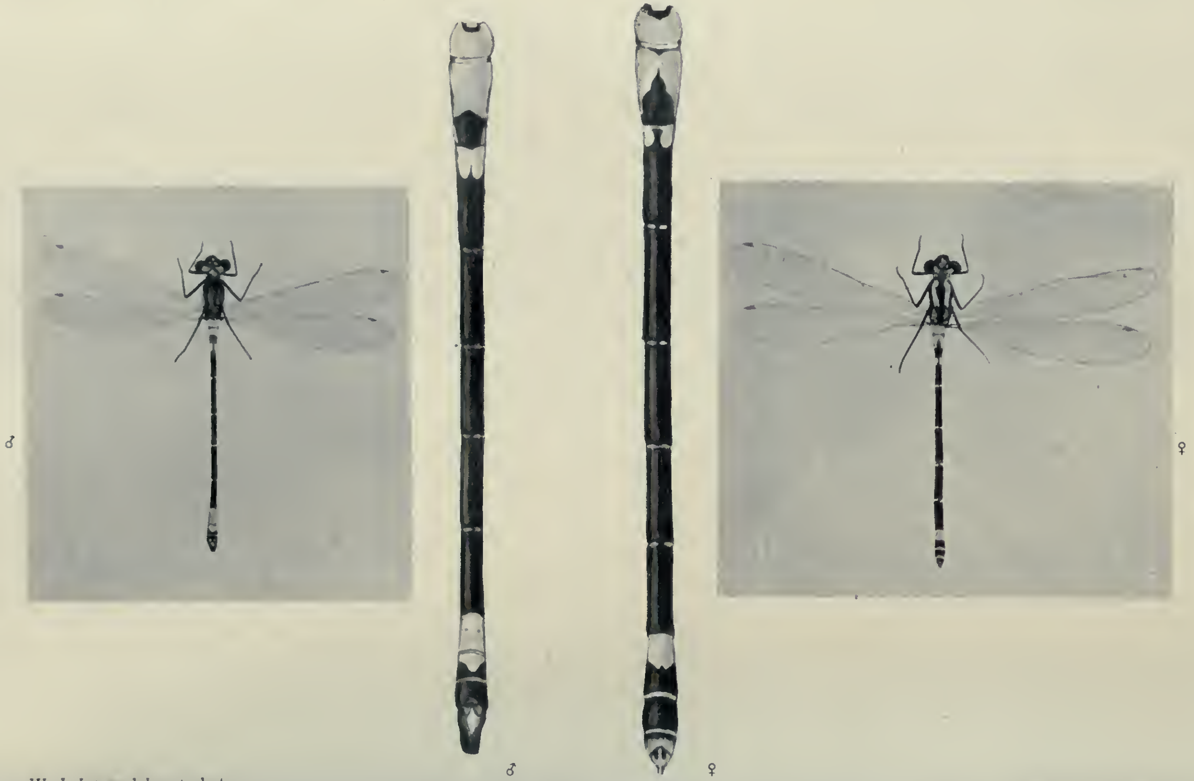
CHAPTER I. of this excellent and valuable work treats of the general characters of Tsetse-flies, and how they may be distinguished from other flies, especially members of the genera *Stomoxys* and *Hæmatopota*, with which species of *Glossina* might be confused. Distribution is also referred to, and a map of Africa with the "fly-belts" indicated thereon shows at a glance the infested areas. In chapter ii. (pp. 8–17) the external characters are discussed. Chapter iii. (pp. 18–22) mainly comprises tables of the groups and species. The other four chapters (pp. 23–105) are devoted to descriptions of the species, together with their distribution, bionomics, early stages (where known), affinities, and distinctive characters.

Newstead's arrangement of the species in groups has been adopted, except that *G. brevipalpis*, Newst., *G. longipennis*, Costi, and *G. medicorum*, n. sp., constitute a fourth group of the genus.

There are twenty-four illustrations in the text; the figures on the plates, which are beautifully reproduced, are from drawings by A. G. Engel Terzi.

Since the publication of Mr. Austen's 'Monograph of the Tsetse-flies' in 1903 there has been very considerable additions to our knowledge of these pests of Tropical Africa; also an increase in the number of described species. In the Monograph (now out of print) only seven species of *Glossina* were known, and *G. palpalis* had not then been recognized as the carrier of the parasite which causes "Sleeping Sickness." In the 'Handbook' under notice fifteen species of "Tsetse-fly" are dealt with, and two of these are described as new to science.

Up to a very recent date Trypanosomiasis had only been traced with certainty to the bite of *Glossina palpalis*. As our author points out, however, there is now reason to suspect that *Trypanosoma gambiense*, the parasite producing "Sleeping Sickness," may be conveyed by other species of Tsetse. It is therefore most important that medical officers and others engaged in fighting disease in Tropical Africa should be able to recognize the species of *Glossina* one from another. With this 'Handbook' at their service there should be little, if any, difficulty in the identification of Tsetse-flies.



W. J. Lucas del. aut photo.

West, Newman proc.

AGRION ARMATUM.

Photos × $\frac{4}{3}$. Drawings × 4.

THE ENTOMOLOGIST

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NOTES ON BRITISH ODONATA IN 1910.

By W. J. Lucas, B.A., F.E.S.

(Plate VII.)

Though I was not able to identify the species, I caught a glimpse of an Agrionid dragonfly in the New Forest on April 26th; but in spite of the fact that the season opened thus early, with the exception of Mr. G. T. Porritt's excursion to the Broads in search of *Agrion armatum*, little of interest has come to hand in connection with this order of insect during 1910. Mr. Porritt tells me that he found the species plentiful at one of the Broads and, if he had wished, could probably have secured a hundred specimens. He took six on May 26th, three on May 27th, and about a dozen on May 28th, the sexes being captured in about equal numbers. Unfortunately he did not discover the headquarters till the 28th, and then had only one and a half hours of sun, divided into two parts by a heavy storm; but the species was on that day quite abundant. The first captured was a blue-marked specimen, and, curiously enough, Mr. Porritt does not think he saw another, he therefore concludes it is a rare form. This specimen was of as bright a blue as that of *Agrion puella*, *Ischnura elegans*, or *Erythromma naias*. All the other specimens had brilliant green markings, except three teneral females (taken *in cop.* with adult males), which were very dingy. There is no mistaking these *A. armatum* amongst the *Agrion pulchellum*, *A. puella*, *I. elegans*, &c., with which they fly, their green bodies, shining like emeralds, making the insects very conspicuous. This bright colour unfortunately disappears rapidly as the dragonflies dry. Mr. Porritt found many dragonflies about, though it was somewhat early in the season. He enumerates:—*A. pulchellum*, *A. puella*, *Pyrrhosoma nymphula*, *E. naias*, *I. elegans* (abundant), *Libellula quadrimaculata* (in good force), *Brachytron pratènse* (common), *Libellula fulva* (getting nicely out, though still teneral, and evidently going to be common again).

On June 5th a large dragonfly, seen in Prince's Coverts near Claygate, Surrey, could not have been anything except *Anax imperator*. Here also were seen one or two *Libellula depressa* on June 12th, and a female *A. puella* on June 19th. At the Black Pond, in the same neighbourhood, on June 12th, *Pyrrhosoma tenellum* was taken in teneral condition, *Cordulia ænea* seemed fairly numerous, as also was *L. quadrimaculata*, while *A. imperator* was no doubt sighted more than once at a distance over the pond, and three of its empty nymph-skins were obtained. On June 19th, at the Pond, there were found:—*L. quadrimaculata* and its variety *prænubila*, *C. ænea*, *A. imperator* (numerous, one male being captured), *Calopteryx splendens*, *P. nymphula*, *P. tenellum*, and *Enallagma cyathigerum*. At the River Wey, near Byfleet, on June 26th, the dragonflies noticed were:—*C. splendens* (common), *I. elegans*, *Platycnemis pennipes*, and *A. puella*, while an *E. naias* was almost certainly seen, but was not secured. An expedition for *A. imperator* to the Black Pond on July 3rd was unsuccessful, though several were seen.

Near Yarmouth, in the Isle of Wight, on August 11th, *Sympetrum striolatum*, *S. sanguineum*, *Æschna mixta* (one teneral male), *Æ. cyanea*, and *Lestes sponsa*, were met with; while on August 18th an *Ischnura elegans* was taken between Yarmouth and Thorley.

On September 4th, at Silverstream Bog, in the New Forest, *Sympetrum scoticum* was ovipositing by striking the water at random, the male being attached to the female *per collum*. The eggs were being dropped into the open watery holes in the bog, and it is there clearly that the nymphs must be looked for. I took one very teneral example of the species on this date.

Mr. N. P. Fenwick, Jnr., reports:—On June 18th, *P. pennipes*, *I. elegans*, *A. puella*, and *B. pratense* (one seen) at the River Mole, Esher, Surrey; July 30th, an entirely bronze female of *P. tenellum* (variety *melanogastrum*) taken at the Black Pond, Esher; August 7th, one male *C. ænea* taken at the Black Pond, apparently the first recorded capture of the species in August; October 1st, a female *Æ. cyanea* captured in the garden at Esher. This capture of the bronze variety of *P. tenellum* is the first recorded for the Esher district and, I believe, for Surrey.

Mr. T. Thornton Mackeith says (*in litt.*, July 28th, 1910) that he captured *Æschna juncea* at Caldwell and Kilmacolm (identified by Mr. King); he also sent a female *E. cyathigerum* taken at Kilmacolm during the summer of 1910.

Kingston-on-Thames, 1911.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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(Continued from p. 248.)

Ganglbauer's Classification.

Ganglbauer divides the Coleoptera into suborders characterised as follows :—

. I. Suborder **Adephaga.**—Wing-venation of the first type. Testes simple, tubular. Male genital apparatus with only one pair of accessory glands (ectadenia). Ovaries with alternating nutritive and egg-chambers. Four Malpighian vessels. Larvæ orthognathous; campodeiform or only slightly departing from that form ; with two-jointed tarsi.

One family-series. Families: Carabidæ, Dytiscidæ, Haliplidæ, Gyrinidæ, Rhysodidæ, Cupedidæ, Paussidæ.

II. Suborder **Polyphaga.**—Wing-venation of the second or third types. Testes compound, consisting of follicles. Male genital apparatus with one or more pairs of accessory glands. Ovaries with single terminal nutritive chamber. Four or six Malpighian vessels. Larvæ with long or short legs, having one-jointed tarsi, or without legs; campodeiform or eruciform; orthognathous, hypognathous, or pseudorthognathous.

1. Family-Series Staphylinoidea.

Wing-venation of the second type, in some forms so reduced that the type cannot be recognized. Gular sutures not confluent. Pleural sutures of prothorax distinct.* Antennæ simple, or with the terminal joints thickened to form an unflattened club, occasionally irregular. Tarsi with a variable number of joints. Testicular follicles sessile. Male genital apparatus with two pairs of accessory glands (ectadenia and mesadenia). Four Malpighian vessels. Larvæ campodeiform, or not widely derivative therefrom, never grub-like or eruciform.

Families: Staphylinidæ, Pselaphidæ, Scydmænidæ, Silphidæ, Clambidæ, Leptinidæ, Platypsyllidæ, Aphænocephalidæ, Corylophidæ, Sphæriidæ, Trichopterygidæ, Hydroscaphidæ, Scaphidiidæ, Histeridæ.

2. Family-Series Diversicornia.

Wing-venation of the third type, or approximating towards the second type, in some forms very reduced, and then without recognizable type. Gular sutures not confluent. Pleural sutures of prothorax distinct. Antennæ variously constructed. Tarsi with variable number of joints (five to one), exceptionally heteromerous, but then only in one sex. Testicular follicles sessile. Male genital apparatus with two or three pairs of accessory glands (ectadenia and mesadenia). Four or six Malpighian vessels. Larvæ campodeiform or derivative therefrom; ortho- or hypo- or pseudortho-gnathous; sometimes without legs; generally straight, seldom with curved body, like the cockchafer grub.

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* For *pleural* we should read *pleuro-sternal*, both here and in the following groups, in order that this character may be correct.—C. J. G.

Families, provisionally arranged: Cantharidæ, Melyridæ, Cleridæ, Corynetidæ, Derodontidæ, Helodidæ, Dascillidæ, Chelonariidæ, Rhipiceridæ, Cebrionidæ, Elateridæ, Eucnemidæ, Throscidæ, Buprestidæ, Lymexylonidæ, Bostrychidæ, Anobiidæ, Lyctidæ, Sphindidæ, Aspidiphoridæ, Ciidæ, Dermestidæ, Nosodendridæ, Byrrhidæ, Dryopidæ (=Parnidæ), Georyssidæ, Cyathoceridæ, Heteroceridæ, Hydrophilidæ,* Sphæritidæ, Ostomidæ (= Trogositidæ), Byturidæ, Nitidulidæ, Synteliidæ, Cucujidæ, Erotylidæ, Catopochrotidæ, Phalacridæ, Thorictidæ, Gnostidæ, Lathridiidæ, Mycetophagidæ, Adimeridæ, Colydiidæ, Endomychidæ, Coccinellidæ, ? Pseudocorylophidæ.

3. Family-Series Heteromera.

Wing-venation of the third type. Gular sutures not confluent. Pleural sutures of prothorax distinct. Antennæ generally simple, more rarely serrate, pectinate or flabellate, or with thickened club-like ending. Tarsi heteromerous, five-jointed in the front and middle legs, four-jointed in the hind pair. Testicular follicles sessile. Male genital apparatus with two or three pairs of accessory glands (ectadenia and mesadenia). As a rule six, exceptionally only four, Malpighian vessels. Larvæ hypognathous; generally with short legs.

Families, in provisional order: Œdemeridæ, Pythidæ, Pyrochroidæ, Xylophilidæ, Anthicidæ, Meloidæ, Rhipiphoridæ, Mordellidæ, Melandryidæ, Monommidæ, Nilionidæ, Othniidæ, Ægialitidæ, Lagriidæ, Petriidæ, Alleculidæ (=Cistelidæ), Tenebrionidæ, Trictenotomidæ.

4. Family-Series Phytophaga.

Wing-venation of the third type. Gular sutures not confluent. Pleural sutures of prothorax distinct. Antennæ generally simple, less often serrate, pectinate, &c., or with thickened terminal joints, very rarely irregular. Tarsi crypto-pentamerous, *i. e.* five-jointed, with the fourth joint very small, firmly united with the fifth, and sometimes very indistinct, the first three joints with broad sole; rarely distinctly pentamerous and simple.

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* See note at end of Classification.

Testicular follicles rounded and pedicellate. Male genital apparatus with only one pair of simple or forked accessory glands (ectadenia). Six Malpighian vessels.* Larvæ hypognathous or pseudorthognathous (Cerambycidæ), with somewhat short, short or rudimentary legs, or without legs.

Families: Cerambycidæ, Chrysomelidæ, and Bruchidæ.

5. Family-Series Rhynchophora.

Wing-venation of the third type, or approximating to the second type.† Head generally elongated and snout-like. Gular sutures confluent. Pleural sutures of prothorax gone. Epimera united behind the prosternal process. Antennæ straight, or with elongate first joint and geniculate, the end joints then thickened and claviform. Tarsi crypto-pentamerous, and only exceptionally distinctly five-jointed, sometimes, as in the Proterrhinidæ and Aglyceridæ, which probably belong to this group, crypto-tetramerous or trimerous. Testicular follicles rounded, pedicellate. Male genital apparatus with variously differentiated accessory glands. Six Malpighian vessels. Larvæ hypognathous; with short legs or without legs; eruciform.

Families: Anthribidæ, ? Proterrhinidæ, ? Aglyceridæ, Brenthidæ, Curculionidæ, Ipidæ (= Scolytidæ).

6. Family-Series Lamellicornia.

Wing-venation of the third type, or by means of reduction approximating to the second type. Gular sutures separated. Pleural sutures of prothorax distinct. Antennæ with highly differentiated club. Legs highly differentiated; the front pair generally, by the structure of their tibiæ, adapted for digging. Tarsi five-jointed, quite exceptionally four-jointed. The front tarsi in many Coprophoga wanting in both sexes or in the male only. Testicular follicles rounded and pedicellate. Male genital apparatus with only one pair of accessory glands (ectadenia), exceptionally (*Cetonia*) with three pairs (one pair ectadenia and two pairs mesadenia). Four Malpighian vessels. Larvæ hypognathous, generally without ocelli, with thick curved body, and with legs.

One family: Scarabæidæ.

Not long after this classification was published, Ganglbauer had to reconsider the position of the family Hydrophilidæ, and he decided to withdraw it from the family-series Diversicornia, and to recognize it as a distinct group in itself.* This group or family-series—the Palpicornia—he places between the Staphylinoidea and the Diversicornia. The larvæ of many of the genera possess anal cerci, and from this he concludes that the group cannot be derived from any other, even the most primitive forms, existing amongst the Diversicornia; on the other hand, the imagines have the Cantharoidean type of wing-venation, hence the group cannot be merged in the Staphylinoidea.

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* According to L. Dufour, *Donacia* forms an exception with only four of these vessels, and other exceptions will probably be made known when a sufficient number of the more primitive forms have been investigated.

† An obvious misprint, which I have corrected, occurs here in the original, the 2 and 3 being interchanged. It is copied by Grobben in his edition of Claus's 'Lehrbuch der Zoologie.'

Lameere's Classification (1903).

In this also the Coleoptera are divided into two suborders—the Adephaga and the Polyphaga.

The Adephaga are subdivided into two groups: the Cupediformia and the Carabiformia.

The Polyphaga are at first subdivided into two main sections or branches—the Cantharidiformia and the Staphyliniformia—corresponding with two of the three suborders of his earlier classification.

The Cantharidiformia are, as in that classification, further subdivided into ten groups or family-series, seven of which, taken together, are equivalent to Ganglbauer's single series—the Diversicornia. The Rhynchophora are not recognized as a separate family-series, but, as derivative from the Phytophaga, are merged in that series.

This classification is not so different from Ganglbauer's as it may at first sight appear. The division of the Polyphaga into two main branches, although not accepted by Ganglbauer in his classification, is quite in accordance with his views. For he admits of a Protostaphylinideon, from which the Staphylinoidea are derived; and he admits also of a Protocanthardeon, from which directly, he thinks, each of the other five groups of the Polyphaga, with the exception of the Rhynchophora, may be derived. And since he agrees with Lameere that the Rhynchophora are derived from the Phytophaga, he ought to have included both in one group as Lameere has done, or else found some other means of expressing this view in the classification. I am myself not convinced that the Rhynchophora are derived directly from the Phytophaga, nor do I think they are more distinct from the Chrysomelidæ than are the Longicorns. Probably all three have been derived independently from the same or very closely related ancestors; and I would suggest therefore the retention of the name Tetramera for the single large series, including the three minor groups: Longicornia, Phytophaga (in the old sense), and Rhynchophora.

(To be continued.)

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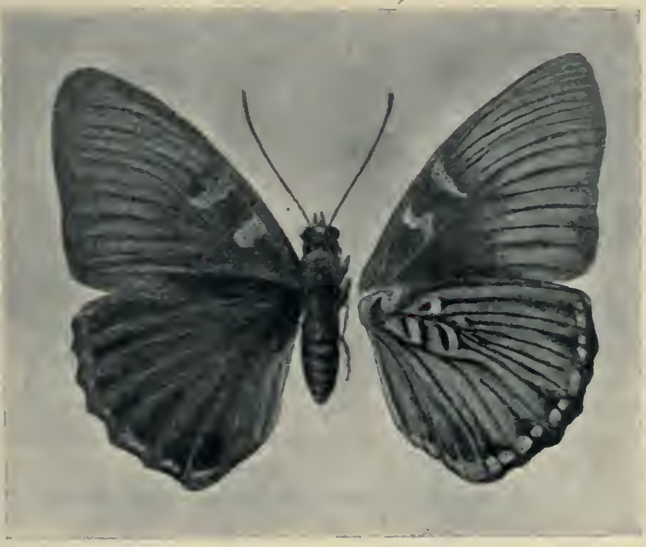
* 'Käfer von Mitteleuropa,' Bd. iv. p. 151 (1904).

EURIPUS FULGURALIS, MATSUMURA.

BY A. E. WILEMAN, F.E.S.



THE type of this species, which is in the Taiho Ku Museum, North Formosa, was taken by Mr. Kikuchi at Hokuzancho, Horisha, Nantocho, Formosa, in May, 1908. It seems to be closely allied to *Euripus funebris*, Leech (Butt. China, Japan, and Corea, p. 150, pl. xvi. fig. 1), judging from a coloured drawing of the type kindly made for me by Mr. Kawa Kami, Director of the Taiho Ku Museum. The discal cell of the fore wings has two rather wide transverse crimson bars, instead of a longitudinal crimson streak as in *E. funebris*; and there is a narrow interrupted outer-marginal crimson band on the hind wings, becoming obscure towards the costa. On the under side of fore wings the crimson bars are placed as on the upper side, but they are somewhat narrower, and the first is irregular; there are no bluish marks in the cell or between the veins; on the basal area of the hind wing are six crimson spots, two of these are bar-like and placed in the cell, two others are above the cell and more or less in line with a confluent basal pair; the outer marginal crimson band is broader than on the upper side, more macular, and extended along the abdominal margin almost to the base of the wing. Expanse 86 millim.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 243.)

The small cross nervules representing the secondary bifurcations of iii, and the junction of ii_5 with iii_1, and iii_3 with iv_4, and which form the outer edge of the discoidal cell, are amongst the most characteristic parts of the neuration of the fore wing both in shape and texture. They are very thick and strong in *varia* and *dictynnoides*, and almost as thick in *asteria* and *aurelia*; fairly thick in *athalia* generally, but rather variable in this species, thicker in *berisalensis* than in typical *deione*, in Swiss than in Italian *parthenie*, and in *dictynna* than in *britomartis*, though they are by no means thick in any of these; they are, indeed, very thin in southern *parthenie* and in *deione*, and in *britomartis* are so slight that they tend to melt away with the action of the chemicals used in denuding the wings of their scales—at any rate, in the case of those portions which belong exclusively to iii, which are always somewhat slighter than the rest, the thinnest part invariably being the upper fork of the lower branch of the obsolete iii. The junction of iii_1 with ii_5, when it exists, and that of iii_3 with iv_1, always points from the base upwards, generally sharply, though the former nervule in the case of *britomartis* makes a wide angle, sometimes quite a right angle. The other four nervules, which belong to iii, may be said normally to form a somewhat straggling W, a formation which is very clear in *M. merope*, and it is by the flattening of some of these lines and the extension of others that the characteristic differences in the shape of the discoidal cell are produced. I shall call these nervules "the W," and speak of them as the first, second, &c., strokes of the W, counting from the costa downwards. The outer edge of the discoidal cell is flattest in *varia*, and most irregular in *parthenie*, but, though this is always true of the former, yet the degree of flatness or evenness varies. The first three strokes of the W are generally flattened out into an almost straight line, though the first two sometimes form the base of a U, and the fourth stroke makes with them an angle of only about 170°. The same formation obtains in *asteria*, except that a much sharper angle is formed by the fourth stroke, giving the effect of a slight peak at the lower outer corner of the discoidal cell. This peak is very distinct in *aurelia*, the first three lines being sometimes nearly straight, but the W sometimes very distinct, even in insects taken at the same time and place; the peak is sharper and even more distinct in *dictynnoides*, and the W sometimes plainer, the third stroke standing distinctly away from the first two, even if the former are rather a shallow U than a V. In *athalia* this peak is very distinct, but the resemblance to a W ceases altogether in the male, though remaining in the female, the four strokes in the former being merely a slightly wavy line. *Dictynna* is slightly variable, but the first two strokes are generally distinct, the last two frequently so, but there is very little peak. In *britomartis* there is none at all; the four strokes form a rather straggling Greek ε. In *deione* the practical meeting of iii_1 and iii_2 almost entirely does away with the first two strokes, but the third and fourth are fairly distinct, and there is a small peak. In *berisalensis* these first two are represented by a short, straight, or curved line, and the peak is rather smaller. In *parthenie*, especially the more northern ones, the peak is very definite and acute, but the first three strokes are almost straightened out into one, the four forming a broad V rather than a W. The other nervures of the fore wing give no characteristics.

In the hind wing the short pre-costal nervure (marked *p* in the diagram) presents surprisingly marked characteristics on careful inspection. It forms a sharply defined angle with i at its point of departure, and this may be a right angle, or rather greater, or less. It forms, again, in most species another angle about the middle of its course, which again may be a right angle, or greater, or less; this latter angle, however, is not sharply defined, but generally slightly rounded, and I speak of it as greater than a right angle if the actual angle is so where the nervure bends, even if it afterwards approaches i. These two angles I refer to as (*a*) and (*b*).

In *asteria* (*a*) is a right angle, (*b*) is greater, no part of the nervure being approximately parallel with the costa; the second portion does not approach i, and stops well short of the costa. In *varia* both angles are slightly less than a right angle; a slight approach is made towards i, but in the female, and sometimes also in the male, the second portion is very long and nearly reaches the costa. In *aurelia* (*a*) is slightly greater and (*b*) slightly less than a right angle, the nervure is nowhere nearly parallel with the costa, but nearly touches it in the female. In typical *deione* the nervure starts at a right angle and then stops short. In *britomartis* it is the same, except that there is a very slight curve where the second portion should begin. In *dictynna* (*a*) is less than a right angle, and the whole nervure is then curved much like a scythe-blade. In *dictynnoides* it is much as in *dictynna*, but the curve is wider and shorter. In *berisalensis* (*a*) is a right and (*b*) an obtuse angle, and at the latter there is a short branch returning towards the base (see diagram). This is also present in *athalia*, but much less conspicuously so; both angles are slightly obtuse, but the second portion of the nervure curves inwards. In *parthenie* (*a*) is less, (*b*) greater than a right angle; there is no return branch, but a slight thickening at (*b*).

The only distinctions afforded by i and ii are that in *varia* and *aurelia* the former springs in a more upright position from the latter, and that in *asteria* ii is further from i and nearer to iii towards the base than in any other species.

The nervures of the hind wing which show most variety are iii_1 and iii_2, but, on the other hand, they vary somewhat in the same species. In *varia* the stem appears to belong to iii_1 rather than to ii, as it really does, and to some extent this is also the case with *dictynnoides*, though in this species the formation tends towards that of *aurelia* (*v. infra*); it seems to belong equally to ii and to iii_1 in *aurelia*, *berisalensis*, and *britomartis*, and equally to ii and iii_2 in *deione*, *parthenie*, *athalia*, and generally in *dictynna*; only in *asteria* does it obviously belong to ii. In *aurelia* nearly always, and sometimes in *parthenie* and *athalia*, ii, iii_1, and iii_2 branch off from the same spot; in *asteria* there is a short transverse nervule placed slantwise between ii and iii_1, and a shorter and more perpendicular one joining iii_1 and iii_2, though the latter is sometimes absent, iii_1 and iii_2 forking out from one another as they do in *athalia*, *parthenie*, *deione*, generally in *varia*, and sometimes in *dictynna*. In all these latter, and in *britomartis*, and occasionally also in *aurelia*, there is a transverse nervule of varying length, joining ii and iii_1; *varia* sometimes has iii_1 and iii_2 joined by a short, nearly perpendicular nervule, as in *asteria*, these two nervures being occasionally joined by a short, curved nervule in *dictynna*, and nearly always in *britomartis*.

Traces of the closing of the cell in the hind wing are to be found, in this group, in *asteria*, *varia*, *dictynnoides*, and more slightly in *aurelia*; this is always represented by a short spur rising from iii_3 near its point of departure from iv_1 (represented in the diagram, though it never occurs in *berisalensis*); and sometimes in *dictynnoides*, and generally in *varia* (as in some species of the other groups) there is a corresponding spur issuing downwards from iii_2; in one specimen of *varia* ♀ I have found these two spurs uniting so as to close the cell completely, as in the Argynnids and Brenthids;* on the other hand, I have found one *varia* ♂ devoid of either spur.

In *deione*, iii_3 branches off slightly nearer to the outer margin than in other species. In *varia*, iv_1 and iv_2 are parallel, and almost so in *asteria*, *deione*, *berisalensis*, and *athalia*, but diverge more in the other species, though the difference is not very noticeable.

Nervure α is decidedly convex in *parthenie*, slightly so in *athalia* and *dictynnoides*, slightly angulated (in a convex direction) near its inception in *aurelia*, *varia*, and *dictynna*, straight in *asteria* and *deione*, straight or slightly convex in *britomartis*, and straight or slightly angulated in *berisalensis*. In *britomartis*, and much more markedly in *dictynna*, β is concave towards the disc; in *deione* and *berisalensis* it is first slightly concave and then slightly convex, being somewhat ogival in form; it inclines to convexity more or less in *parthenie*, and is nearly or quite straight in the other species.

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* Notwithstanding Spuler's diagrams to the contrary, I have never so far found a Brenthid with the cell open. In *selene*, which he gives as an example with open cell, I have invariably found it closed.

As many of these distinctions are not to be observed without denuding the wings, and are, therefore, useless for the determination of specimens which are to be preserved for the cabinet, it appears to me useless at this point to attempt to place them in tabular form, which may, however, prove useful when treating of the phylogeny.

(To be continued.)

DRAGONFLIES OF THE NEW FOREST.

By W. J. Lucas, B.A., F.E.S.

In the Victoria History of Hampshire is to be found a list of the dragonflies of the New Forest; but as this list is much out of date a new one will probably be of use to entomologists visiting that interesting locality. As was to be expected in a large area that has always been to a great extent in a state of nature, where bogs as well as small ponds and streams are numerous, the dragonfly fauna is well represented. Of forty-two species which occur in the British Isles twenty-seven at least have been met with in the New Forest. *Oxygastra curtisii* has been recorded, but it is possibly the locality a few miles to the west that is intended. *Libellula fulva* is also found in this same locality, and has been taken at Ringwood (K. J. Morton, 1897), but a mile or two outside the Forest borders. Of those not yet recorded we might expect *Sympetrum vulgatum*; *S. fonscolombii* (casually); *Somatochlora metallica* (possibly); and the rest of the Agrionids known as British—*Lestes dryas, Erythromma naias, Agrion pulchellum, A. armatum*, and *A. hastulatum*. It may be that others are simply awaiting a discoverer to become British also.

1. *Sympetrum striolatum.*—Very common in late summer and autumn.
2. *S. flaveolum.*—A male was taken at Denny Bog by Major Robertson and given to me in 1900.
3. *S. scoticum.*—On boggy ground, the nymphs probably living in the watery spots in the bogs.
4. *Libellula depressa.*—A fairly common spring species, sometimes continuing into August.
5. *L. quadrimaculata.*—Like the last, an early species.
6. *Orthetrum cærulescens.*—Very common, probably breeding in the bogs in the same way as *S. scoticum.*
7. *O. cancellatum.*—Captured near Brockenhurst, June 26th, 1902

(K. G. Blair), and once taken by myself in August in Dame's Slough Inclosure.

8. *Cordulia ænea.*—Reported by Mr. W. J. Ashdown, but apparently not common.
9. *Gomphus vulgatissimus.*—At two streams in the south of the Forest.
10. *Cordulegaster annulatus.*—A fine insect, common in the Forest, flying throughout the summer.
11. *Anax imperator.*—This, the largest European dragonfly, seems to be fairly common. Though appearing in the spring, it extends into August.
12. *Brachytron pratense.*—Near Beaulieu in 1900 (F. M. B. Carr).
13. *Æschna mixta.*—Occasionally taken—the smallest and least common of the Æschnas of southern Britain.
14. *Æ. juncea.*—As the previous species, met with occasionally; not easily distinguished on the wing from the following one.
15. *Æ. cyanea.*—Fairly common in summer and autumn.
16. *Æ. grandis.*—Not common in the New Forest. Mr. Clark (Ent. Record, vol. ii. p. 301) records it at dusk, and on August 3rd, 1901, I saw one at Oberwater.
17. *Calopteryx virgo.*—Very common.
18. *C. splendens.*—Occurring locally, but not common.
19. *Lestes sponsa.*—At ponds, but perhaps not frequent.
20. *Platycnemis pennipes.*—Common, especially along streams.
21. *Pyrrhosoma nymphula.*—Common, and on the wing for a long time. The form of the female (var. *melanotum*), with black-bronze abdomen, occurs.
22. *P. tenellum.*—Very common, especially over the bogs. The forms of the female (vars. *melanogastrum* and *erythrogastum*), with black-bronze and crimson abdomens, respectively, are fairly frequent.
23. *Ischnura pumilio.*—Common in a few localities in the south of the Forest, probably breeding in boggy ground. It was rediscovered there, June 3rd, 1900, by Mr. F. M. B. Carr and myself. The var. *aurantiacum* is frequent.
24. *I. elegans.*—Fairly common and well distributed.
25. *Agrion puella.*—Fairly common.
26. *A. mercuriale.*—In several localities—common in some—appearing in the spring and remaining on the wing during the summer. It seems to like a stream running through a bog.
27. *E. cyathigerum.*—Occurring, but apparently not very commonly.

Kingston-on-Thames: July, 1911.

A NEW MOSQUITO FROM PARAGUAY.

By E. H. Strickland.

Janthinosoma paraguayensis, nov. sp.

♀. Head clothed on the vertex with yellow, upright, forked, and spindle-shaped scales, with deep violet scales at the sides. A few yellow hairs project between the eyes. Palpi with blackish, somewhat outstanding scales and bristles. Proboscis with similar coloured closely appressed scales. Disc of thorax covered with blackish-purple spindle-shaped scales, lateral and posterior margins with yellow scales, which are most numerous on the anterior half of the mesonotum, where they form a more or less distinct lateral spot. Prothoracic lobes with a few cream-coloured scales and black hairs. Anterior and posterior femora, except for their apices and the posterior side, and the middle femora except for its apex, golden yellow. Coxæ with cream-coloured scales. Hind legs without very densely outstanding scales. Fourth hind tarsus white, last hind tarsus dark.

Wings dusky brown, with brown scales and veins. Hind cross-vein not less than its length from small cross-vein. Abdomen with white scales on the first segment and hind angles of all the other segments except the last one, reddish-purple scales on second segment, and dark purple on all remaining segments. Under side of all segments except the last with apical bands of white scales. First two segments golden yellow, with white scales all over. Length, 5·5 mm.

Habitat.—Pueto Max, Paraguay.

Season when found, January to April. Taken by Verzényi in 1905. Described from a single female.

Differs from *Janthinosoma varipes* (Coquillett) in that the disc of the thorax is entirely covered with dark scales.

South-Eastern Agricultural College, Wye.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. Distant.

Fam. BERYTIDÆ.

Hubertiella cardamomi, Kirk., J. Bombay N. H. Soc. xiv. p. 303, pl. A, f. 16, pl. C, f. 5 (1902); Dist. Faun. Brit. Ind. Rhynch. i. p. 424, f. 249 (1902).

Mr. E. E. Green has sent me varietal specimens of this species in which the two dark spots on the posterior pronotal lobe are almost or entirely obliterated. These specimens were taken from *Strobilanthus* sp., so that the species is seen to be not entirely confined to *Elettaria cardamomum*.

Fam. TINGIDIDÆ.

Genus Serenthia.

Serenthia, Spin. Ess. p. 168 (1837). Type, *S. atricapilla*, Spin.

Serênthia carinata, sp. n.

Head black, a little elevated between the eyes; antennæ brownish ochraceous, fourth joint apically black, first and second joints short, distinctly thickened, second a little shorter than first; pronotum black, the anterior margin and the apical area behind the lateral angles, dull pale ochraceous, distinctly, centrally, longitudinally carinate for its entire length, coarsely punctate; elytra finely areolate, excluding costal area, black for about two-thirds from base, subcostal area shaded with ochraceous, margins of the areolets black, or piceous except on costal area where they are ochraceous; body beneath black; legs pitchy-brown. Long. 3 millim.

Hab. Ceylon; Ambalangoda Lake (E. E. Green).

Allied to *S. gibba*, Fieb., from which it structurally differs by the pronotum being distinctly longitudinally carinate for its entire length. Taken from *Juncus* sp. (E. E. Green).

Hegesidemus, gen. nov.

Elongate, narrow; shortly spinous; eyes inserted at base of head and close to anterior margin of pronotum; antennæ with the first and second joints short and thickened, second globose, shorter than first, third long and slender, fourth incrassate, a little longer than first and second together; pronotum strongly longitudinally tricarinate, the anterior lateral margins moderately dilated, hyaline and areolate, an anterior hood not covering base of head and which is centrally strongly longitudinally carinate, the anterior pronotal area distinctly convex, the posterior area or process angularly narrowed; elytra elongate, discoidal area extending to about the middle of the elytra and with its margins distinctly raised, subcostal area somewhat narrow, costal area hyaline, areolate, broadest on apical half, sutural area long and very finely areolate, more broadly so at apex; legs of moderate length and slender.

Allied to *Teleonemia*, Costa, from which it principally differs in the dilated, areolate lateral margins of the pronotum.

Hegesidemus eliyanus, sp. n.

Head piceous, eyes black; antennæ brownish ochraceous, the apical joint piceous; pronotum with the anterior area castaneous, the posterior area piceous, the longitudinal carinæ and sometimes the hood, more or less ochraceous, the lateral dilated margins hyaline, areolate, the margins of the areolets fuscous; elytra black or piceous; the costal area hyaline and areolate, the areolets in two longitudinal series, their margins fuscous, the discoidal area either altogether piceous, or brownish ochraceous with the raised margins darker, the disk rugulosely punctate, costal area hyaline and areolate, the margins of the areolets piceous or fuscous, sutural area piceous and with an intermediate pale spot near apex; sternum black; abdomen beneath testaceous, the base and apex black; legs brownish ochraceous; elytra longly passing the abdominal apex; other structural characters as in generic diagnosis. Long. 5 millim.

Hab. Ceylon; Nuwera Eliya (E. E. Green).

Taken from *Strobilanthus* spp. (E. E. Green).

Dr. Horváth (Ann. Mus. Nat. Hung. ix. p. 337), among some other proposed synonymy which will subsequently receive attention, has stated:—"*Galeatus*, Curt., Ent. Mag. i. p. 196 (1833) = *Cadmillos*, Dist., Ann. Soc. Ent. Belg. liii. p. 113 (1909); *id.* Faun. Brit. Ind. Rhynch. v. p. 107 (1910).

I have figured both these genera, and given differential structural characters, and must be content to leave these figures and descriptions to speak for themselves.

NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

Aracima serrata, sp. n.

Fore wings greenish yellow; crescent at outer end of the cell, and postmedial line dark purplish; the line bluntly serrated, indented above dorsum. Hind wings greenish yellow; postmedial line purplish, diffuse towards the costa, where there are clusters of purplish dots on each side of the line. Fringes of all the wings purplish. Under side yellowish, markings as above; the hind wings rather paler than the fore wings.

Expanse, 44 millim.

A male specimen from Rantaizan (7500 ft.), May 10th, 1909.

Collection number, 1824.

Alcis arizana, sp. n.

Fore wings brownish with a faint purplish tinge, finely sprinkled with black atoms; ante- and postmedial lines black, the first indistinct, bluntly angled below costa, the second almost parallel with termen, bluntly serrate; space between lines paler, almost whitish; discal mark dusky. Hind wings similar in colour to median area of fore wings; postmedial line blackish, curved, and tapered towards the costa. Fringes preceded by a brown crenulate line. Under side of fore wings hardly paler between lines; a pale apical patch and smaller pale patch below middle of terminal area; lower two-thirds of postmedial line on hind wings double.

Expanse, 36 millim.

One example of each sex from Arizan (7500 ft.), September, 1906.

Collection number, 797.

Alcis brevifasciata, sp. n.

Fore wings ochreous brown; ante- and postmedial lines represented by black dots on the veins, each line from a blackish spot on the costa; basal patch blackish; discal spot black, oval, a diffuse spot above it on the costa; subterminal line whitish but not clearly defined, passing through blackish clouds at apex, above middle, and at tornus; area beyond the line powdered with blackish, black bars between veins in upper part. Hind wings ochreous brown, paler on costal area; a broad blackish central band, not extended to costa, enclosing black discal dot; terminal area barred with blackish as on fore wings, and clouded with blackish towards tornus; traces of a pale subterminal line. Fringes preceded by an interrupted line of black lunules. Under side ochreous brown, powdered with blackish; all the wings have a black discal spot, and a dentate postmedial line also blackish.

Expanse, 34 millim., ♂; 36 millim., ♀.

A male specimen from Arizan (7500 ft.), September, 1906; and a female from the same locality, August, 1908.

Collection number, 800.

Hemerophila cuneilinearia, sp. n.

♂. Pale cinnamon-brown, striated and mottled with darker. Fore wings with two pale-edged blackish lines, the antemedial which is sinuous, bidentate towards the costa, commences near middle of costa, and terminates on dorsum at one-fourth from base; the postmedial is acutely angled below the costa and from this angle a blackish streak runs to termen below apex, the middle of the line is bent inwards towards the antemedial; space enclosed by lines greyish. Hind wings finely striated with blackish on basal two-thirds; outer third suffused with reddish brown; postmedial line blackish, slender, sinuate, internally edged with whitish; subterminal line pale, outwardly edged with dark brown, wavy. Under side pale greyish brown, speckled with dark brown and blackish; all the wings have a black discal spot at end of cell, and a series of black dots representing postmedial line.

♀. Similar to the male, but the central third of fore wings is suffused with blackish, and the ante- and postmedial lines are consequently obscured; the black striation on hind wings is heavier.

Expanse, 46 millim.

One example of each sex from Kanshirei (1000 ft.). The female obtained in May, and the male in June, 1908.

Collection number, 798.

Allied to *H. subplagiata*, Walk.

(To be continued.)

BY THE WAY.

"Notice.—Sugaring on Trees is Prohibited. By Order," is a legend erected high on a venerable oak of Queen's Bower, in the New Forest, and probably unique among the many warnings to wanderers throughout the world. We remember that Herbert Goss had something to say respecting the legality of a prohibition which could relate to damage only in so far that lepidopterist sugar might be supposed to disfigure trees. However the law may run, it is certain that permission to sugar has, we are told, been categorically denied recent applicants by Mr. Lascelles, and that the keepers have orders to "clay" all fresh treaclings. During the festivities of last month entomologists foregathered about Brockenhurst and Lyndhurst, but the cold winds of the preceding weeks rendered notable captures scarce and we (who were not looking for them) saw no uncommon Lepidoptera, among which *Tortrix viridana* swarmed everywhere on oak and was equalled in number only by vast hordes of *Orchestes fagi* on beech, the leaves of which were turned half brown by their ravages. *Osmylus* was netted; *Anoplodera* unusually common about Holland's Wood; and *Asemum* found on fir-posts; but *Anthaxia* was not seen when the May blossom was over. We want an entomological guide to the Forest badly; Hutchinson's book mentions only a few species and terms *Cicadetta*, which is by no means uncommon locally this season, "Cicada hæmatoides"; the Victoria History list is peculiarly poor in the less worked groups.

On the contrary, Brandon in May afforded capital collecting, and we have never, during fifteen years, seen insects of all Orders so abundant there. The Staunch and its carr were unusually dry for the time of year, yielding *Hebrus ruficeps*, *Plociomerus fracticollis*, *Chrysomela graminis*, and larvæ of *Sesia bembeciformis*; beetles, though not *Diastictus*, occurred plentifully at the latter locality, with such things as *Trox sabulosus* (seventy were counted in rabbits' fur), *Onthophilus sulcatus* (in rabbits' holes), *Aphodius constans*, and *Cistela luperus*. About Lakenheath *Phyllobius viridicollis* was in great numbers, with a few *Trigonometopus frontalis*. Some sixteen kinds of sawflies and about forty *Parasitica* turned up in a few days. Brandon and Tuddenham Fen, where we also did well, should be more patronised by entomologists; the 'White Hart,' at the former, is a capital inn, whence all the best spots are easy of access.

C. M.

NOTES AND OBSERVATIONS.

GYNANDROUS LYCÆNA ICARUS (ALEXIS).—I should like to record in the 'Entomologist' the capture, on June 9th, near Boscastle, in North Cornwall, of a perfect gynandrous specimen of *Lycæna alexis*, left side male, right side female. I should also like to record the capture, in my garden here, of a number of specimens of *Apamea ophiogramma*.—L. F. HAMMOND; 17, Foxley Gardens, Purley, Surrey, July 7th, 1911.

APATURA IRIS, &c., IN HASLEMERE DISTRICT.—While out for a stroll some three miles from Haslemere town, on Tuesday morning last, the 11th inst., I was surprised by a fine male *Apatura iris*, which suddenly appeared in a woodland path along which I was walking: it settled about six yards in front of me, in a slightly damp place on the path. By carefully approaching, I was successful in netting it. In the same locality I saw a nice sprinkling of *Limenitis sibylla*, as well as a number of *Argynnis paphia*.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere, July 13th, 1911.

Cyaniris argiolus.—I took a specimen of *C. argiolus* this morning; surely this is remarkably early for the second brood, although in such weather almost anything is possible, I suppose!—B. E. J.

Zygæna filipendulæ ab. flava in Surrey. — On July 16th, 1911, I had the very good luck to take a fine specimen of *Zygæna filipendulæ* ab. *flava* at rest on a flower-head of devil's-bit scabious at Coulsdon, Surrey.—J. St. Aubyn; "Tregotham," Endlesham Road, Balham.

Retarded Development on Emergence of Chesias rufata (obliquaria).—On June 18th, at 8 p.m., a specimen of *Chesias rufata* (*obliquaria*) emerged in one of my cages. As its wings had not seemingly begun to develop when I went to bed, I concluded that the pupa had been kept too dry and that the insect would be crippled. Of this I felt certain when I found it in exactly the same condition at 7.30 the next morning. To my surprise, however, at 9 a.m. it was fully developed, and in proper condition. I remember seeing a note of a somewhat similar case, but cannot find the entry.—(Rev.) J. E. Tarbat; The Vicarage, Fareham, Hants.

Note on Larvæ of Merodon equestris, F.—Not without some regret I write to inform your readers and Mr. F. J. Chittenden of another bulb attacked by these larvæ. Last winter four or five bulbs of *Hippeastrum* in my greenhouse were found to be infested with fair-sized grubs which I at once suspected to be *Merodon*; so to make sure, they were placed in a breeding-cage, and this spring over a dozen imagos made their appearance. Fortunately my bulbs were not very costly ones, but considering the high prices paid for fine varieties, the loss caused by a single female might be serious. Curiously enough, the specific name of this plant is "*equestre*," and of the fly, "*equestris*."—Fredk. C. Adams; Fern Cottage, Lyndhurst, June 22nd, 1911.

Phryxus (Deilephila) livornica in Sussex.—A female specimen of the Striped Hawk-moth was taken here on Sunday, July 2nd, and I should say by her appearance she had not been out of chrysalis very long; she, however, laid about nine eggs in the bottle in which she was kept for the night. I have the insect in my possession, on the setting-board, sorry to say, slightly damaged at tip of fore wings. I have written to you, as I do not think a specimen has been recorded from this district before.—Ernest Streeter; Church Street, Petworth, July 6th, 1911.

Phryxus livornica in Cornwall.—A specimen of the Striped Hawk (*Phryxus livornica*) was recently sent to me by a friend, who got it near Newquay, Cornwall, on June 27th.—R. R. Waters; 1, Hillmorton Road, Rugby, July 23rd, 1911.

Lepidoptera at Light.—The arc lamps in York in early June seem to have proved very attractive to moths, for I found a very large number on the pavements in the town. These included *Acronycta* (*Jochæra*) *alni* (2), *D. chaonia*, several of the dark *Acronycta rumicis*, *Eurymene dolobraria* (2), and a rather good specimen of

Spilosoma lubricipeda var. *zatima*. Species of *Plusia* were strongly attracted, and I found under a couple of lamps *P. pulchrina*, *iota*, *chrysitis*, *gamma*, and *Abrostola triplasia*. While *Dicranura vinula* was very abundant, the specimens were practically always female, and these females seemed to wish to lay the instant they were boxed. I had always supposed that only male specimens of the Notodontidæ were attracted by light. In breeding *Petasia nubeculosa* this year from the egg, I was much struck by the large variety of food-plants which it readily eats. I first experimented with the plants growing in the locality where the parent was obtained—sallow, aspen, bilberry, and dock—the first two of which it seemed at times to prefer to birch. It also ate heather, and I found that it would take greedily lime, ash, hawthorn, willow, alder, plum, strawberry, &c.; probably it is as omnivorous as *P. cassinea*. This does not seem to have been generally recorded, though I am told that Barrett has remarked on its eating other food besides birch.—C. MELLOWS; Bootham School, York.

CARNIVOROUS FEEDING OF PLATYCLEIS BRACHYPTERA.—On July 3rd Mr. R. South was good enough to give me three living Orthoptera, which he had obtained two days previously while trailing his net over the heather at Oxshott, Surrey. One of them was *Gomphocerus maculatus*, and the others were undeveloped females of a species of Locustidæ. One of the Locustids had undergone a moult in the glass-bottomed box in which it was enclosed, and when I looked at it again, I found that it had eaten its own cast skin. On reaching home, I turned out all three specimens into a good-sized fish-globe, and kept them regularly supplied with fresh grass, upon which they fed readily. After the lapse of several days, however, the *Gomphocerus* was noticed to be getting very sluggish in its habits, and the next morning it was found to be dead and partly consumed; later on, one of the Locustids was actually observed to be eating the body greedily. Mr. W. J. Lucas, who kindly examined one of the Locustids for me, stated that it might safely be regarded as *Platycleis brachyptera*, as that species was known to occur at Oxshott, and as *P. roeselii*, the only other species to which it could possibly belong, had not been recorded from that locality.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, July 21st, 1911.

LEPIDOPTERA OF THE BRECKSAND DISTRICT.—In the 'Entomologist' for March (vol. xliv. p. 111) appeared an interesting note on the Lepidoptera of the Brecksand district, near Tuddenham, in Suffolk, by the Rev. J. E. Tarbat. It may be of interest to supplement this by an account of a brief visit to the same locality paid by me this year from June 13th to 16th. I have often before worked this district by day, and, indeed, accompanied Mr. Tarbat on one occasion last year, but have not previously been able to do any night collecting there. The weather was cold, windy, and overcast, which may account for the absence of *Acidalia rubiginata*, and *Agrophila trabealis*, both of which I took on the same dates last year. Sugar was a complete failure, and the following list represents almost entirely the species captured by working hedgerows, rough fields, &c., with a lamp between dusk and moonrise. Considering this and the very unfavourable weather, the results are not unsatisfactory. *Lithostege griseata* was taken, both by beating herbage during the day and during its flight at dusk, and was in fine condition. It is, in my experience, never abundant, and very local. I flushed a single specimen from a small patch of waste land round a haystack on each of three days—June 1st, 14th, and 15th—all fresh and perfect. Certainly it emerges at intervals over a long period, as on the night of June 15th I took a female drying its wings after leaving the pupa. Besides this, the following insects were seen or taken:—*A. psi*, *L. comma*, *L. pallens* (very abundant), *X. rurea* (one fine whitish-grey form), *X. lithoxylea*, *N. saponaria*, *M. sordida*, *M. albicolon* (the Brecksand form is consistently darker than the usual coast type), *C. morpheus*, *R. tenebrosa*, *A. vestigialis* (quite a typical form), *A. segetum*, *A. exclamationis*, *N. festiva*, *D. capsincola*, *D. carpophaga* (pale buff-coloured), *H. serena* (common on fir-trunks), *A. advena*, *H. tripartita*, *P. gamma*, *P. iota*, *P. chrysitis*, *H. uncula* (a single specimen in marshy ground), *B. repandata* (darker and less grey than the Cambridge form), *E. pendularia*, *C. exanthemaria*, *B. taminata*, *P. flavofasciata*, *C. bilineata*, and *T. variata*. Geometers, save for the last-named, were very scarce. It is certainly a most interesting district, and further study of its peculiar fauna seems likely to prove scientifically valuable.—(Rev.) C. E. Raven; 4, Park Terrace, Cambridge.

The Entomological Club.—A meeting was held at the 'Hand and Spear' Hotel, Weybridge, on July 10th, 1911, Mr. Geo. T. Porritt in the chair. Mr. Robert Adkin (O.M.) and Messrs A. H. Jones (H.M.), A. Sich (H.M.), and nine other visitors were present.

SOCIETIES.

Entomological Society of London. — *Wednesday, May 3rd*, 1911.—The Rev. F. D. Morice, M.A., President, in the chair.—The President announced the death of two Fellows of the Society, the Rev. Canon Cruttwell, and Mr. W. A. Rollason. He then informed the Society that the authorities of the Science Museum had persuaded the Government to allow them to take a portion of the land belonging to the Natural History Museum at South Kensington for the purpose of erecting new buildings of their own, thereby precluding much-needed additions to the Natural History Museum, especially in the Entomological Department, and on the motion of Mr. G. T. Bethune-Baker, seconded by Dr. Dixey, a protest was unanimously passed by the Society, the position being explained by both mover and seconder, and further comments being made by Mr. C. O. Waterhouse and the Rev. G. Wheeler on the disastrous results of such a proceeding to the Natural History Museum. Mr. H. Rowland-Brown then moved that "If a deputation be appointed to wait on Mr. Runciman with regard to this matter, the Officers and Council of the Entomological Society desire to be represented on it." This was seconded by Mr. Bethune-Baker and carried unanimously. —Commander J. J. Walker exhibited, on behalf of Mr. Geo. Brown of Coatbridge, Lanarkshire, living specimens of *Helophorus tuberculatus*, Gyll., hitherto exceedingly rare as a British insect. These were taken by Mr. Brown at the end of April, walking about on bare dry peaty soil on the moors near Coatbridge.—Mr. O. E. Janson, a new and remarkable Lamellicorn beetle, belonging to the *Cremastochilides* group of the Cetoniidæ, in which the anterior tarsi were unmistakably six-jointed. He believed this was the first known instance in the whole of the Coleoptera where the tarsal joints exceeded five. The specimen was received from Uganda. Mr. C. O. Waterhouse suggested that it was probably an abnormal specimen, six-jointed tarsi being so far unknown in entomology. Mr. G. C. Champion expressed concurrence in this opinion.—Mr. A. Harrison, a drawer of Delamere Forest *Aplecta nebulosa*, bred last year from var. *robsoni* male and var. *thompsoni* female, by himself and Mr. H. Main. Only fifty moths were bred, 26 per cent. of the grey form, 42 per cent. of *robsoni*, and 32 per cent. of *thompsoni*. This result quite negatives the idea that the form *robsoni* was a heterozygote or hybrid (so-called), and that the grey form and *thompsoni* were homozygotes or pure. All the previous results pointed to this conclusion, but the results obtained last year show that the problem is not so simple as this, and that it will require further experiments before it can be solved.—Mr. Donisthorpe, three females of *Lasius mixtus*, Nyl., a race of *L. umbratus*, Nyl., and a female of the latter for comparison. He remarked that there were only two previous records of its capture in Britain. One of his specimens was taken at Weybridge last year, and another at Mickleham, in company with Mr. Crawley, where they each took a specimen last month. The third was captured this year by Mr. Dollman in Richmond Park.—Mr. H. Rowland-Brown brought for exhibition examples of *Agriades thetis* (*bellargus*) ab. female *cœlestis*, Obthr., taken last August at Dompierre-sur-Mer, Charente-Inférieure. He said that, so far as is known at present, this brilliant form of the blue female is confined in western Europe to the west and south-west of France; roughly speaking between the valley of the Loire and the Gironde, where it occurs locally not unfrequently; the blue form of *A. coridon* female, var. *syngrapha* also being found in the same calcareous region.—Mr. G. W. V. de Rhé-Philipe exhibited and described several new Indian butterflies, *viz.*, *Euplœa mulciber* var. *duarseri* male, *Charaxes raidhaka* male, *Euripus consimilis*, new female dimorphic form *torsa*, *Cyaniris parishii* male, *Nacaduba ardates* var. male *dima*, and new aberration of *Terias silhetana*.—Mr. H. M. Edelsten exhibited three generations of *Hybernia marginaria*, being the result of a pairing between a dark male and female taken wild in Epping Forest in 1908. The 1909 brood did not vary much from the parents. The 1910 brood produced specimens with dark margins and three unicolorous males. The 1911 brood produced specimens with lighter margins and dark interiors, but no unicolorous specimens. The darkest males and females were paired in each case. These dark forms have only appeared in Epping Forest the last few years.—Mr. G. C. Champion sent round living specimens of *Corymbites purpureus* and *Morimus lugubris*, taken by Dr. Chapman at Amélie-les-Bains, Pyrénées Orientales.—Mr. L. W. Newman showed a stick of *Salix* *capræa* containing larvæ supposed to be those of the "Wood Wasp." He pointed out that the larvæ make caps like *Ægeria andrenæformis*, and that the cocoon is exactly like that of a "clear wing," and the workings very like those of *Ægeria*. A discussion arose on this exhibit, in which widely different views were expressed even as to the order to which the larvæ in question belonged.—Mr. A. G. Scorer exhibited a specimen of *Hyloicus* (*Sphinx*) *pinastri*, of whose British origin he had no doubt. It was caught near Aldeburgh, and another specimen was taken at the same time. He also exhibited a gynandromorphic specimen of *Gonepteryx rhamni*, taken by himself at Salisbury, on September 2nd, 1894. It was evenly divided, the right side being female and the left male.—Dr. K. Jordan exhibited some insects from India in one of Mr. Newman's relaxing boxes, which had remained throughout their journey as fresh as if just captured, and were in perfect condition for setting. He also exhibited the Saturniid moth, *Dysdæmonia kadeni*, in its resting attitude. The hind wings are for the greater part concealed under the fore wings, only the anal area and the tail projecting. The abdomen being bent towards the left side, the insect in this attitude resembles a crumpled dry leaf, and recalls the much smaller Bombycid—also exhibited—*Sorocaba anomala*, which, as is well known, assumes a similar attitude when at rest. He further exhibited a species of *Cosmosoma*, family Syntomidæ, partly covered with a white wool. According to the collector (A. H. Fassl), "the insect when touched ejects from a fold on the under side of the abdomen a white wool, which completely envelops the specimen." The hitherto unknown female of *Ogyris meeki*, Roths., a Lycænid from New Guinea, was likewise shown, together with the male and several *Hypochrysops*.—Mr. Hawkshaw exhibited several drawers of Lepidoptera, beautifully arranged and set, placed on squared paper, and with the written history of every insect accompanying it. He explained that the drawers were all interchangeable and were arranged perpendicularly like books, instead of horizontally as usual.—Commander Walker communicated the following papers:—"Some African and a few Australian Aculeate Hymenoptera in the Oxford Museum," by the late Col. Bingham, with a prefatory note by Prof. Poulton; communicated by Rowland Turner. "A Contribution to the Life History of *Hesperia* (*Syrichthus*) *sidæ*," by Harold Powell. "Biological Notes on Indian Pierine Larvæ," by Capt. Frazer.

RECENT LITERATURE.

Our Insect Friends and Foes. By F. Martin Duncan, F.R.P.S. Pp. i–xi. and 1–296. Sixteen Plates. London: Methuen & Co. 1911.

In the sixteen plates Mr. Duncan has presented us with some very fine photographs, relating chiefly to well-known insects. The text too is interesting reading, but it lacks the charm of novelty—we seem to have met with so much of it before, Fabre and others having been drawn on to a great extent. Sufficient reasons are given for including Arachnids in the work, although the title speaks of insects only. The classification of the insects we are bound to state is very inadequate and out-of-date. One would like to see technical terms (*e.g.* pollination, fertilization, animal, nymph) used with a definite meaning. The last, for instance, is now usually applied to the whole stage between ovum and imago of insects, such as dragonflies, with little post-embryonic development. The book has not been at all well seen through the press, the slips in spelling and solecisms in expression being numerous. In a few places errors and questionable statements have crept into the matter.

W. J. L.

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1. *Fortieth Annual Report of the Entomological Society of Ontario.* Many Illustrations. Ontario. 1909. As usual, full of useful information, chiefly in connection with economic entomology.
2. *Nota sobre el Dilar parthenopaeus, Costa.* By L. Navás. (Annuario del Museo Zoologico della R. Università di Napoli.) Pp. 1–4, with fig. Feb. 1910.
3. (i.) *Über die Biologie von Glyphotaelius punctato-lineatus, Retz. nebst Bemerkungen über das freilebende Puffenstadium der Wasserinsekten.* By Dr. C. Wesenberg-Lund. (ii.) *Über die süsswasserbiologischen Forschungen in Dänemark.* By Dr. C. Wesenberg-Lund. (iii.) *Natural History of the Larvæ of Donaciinæ.* By Adam Giede Böving. Pp. 1–108, with seven beautiful plates. (iv.) *Beiträge zur Biologie der Wasserwanze: Aphelocheirus montandoni, Horvath.* By Hj Ussing. (Sonderabdruck aus Internationale Revue der gesamten Hydrobiologie und Hydrographie.) 1910.
4. *A further Contribution towards the Knowledge of the Panorpidæ.* By T. Miyake. Pp. 183–205, with plate. (Journal of the College of Agriculture, Imperial University of Tokyo.) Tokyo. April, 1910.
5. *The Mantispidae of Japan.* By T. Miyake. Pp. 213–227, with plate. (Journ. Coll. Agric. Imp. Univ. of Tokyo.) Tokyo. April, 1910.
6. *Neurópteros chilenos.* By L. Navás. Pp. 335–241, with fig. (Revista chilena de Historia Natural.) June, 1910.
7. *Névroptères des bords de la Meuse et de la Molignée (Namur).* By L. Navás. (Revue de la Société entomologique de Namur.) Oct. 1910.
8. *Crisópidos (Ins. Neur.) nuevos.* By L. Navás. 20 pp. Illus. S. Fiel. 1910.
9. *Annual Report of Christ's Hospital Natural History Society.* Horsham. 1910. Amongst the contents of this excellent report is a local list of the Lepidoptera.
10. *Über Bernsteineinschlüsse im allgemeinen und die Coleopteren meiner Bernsteinsammlung.* By R. Klebs. Pp. 217–242. 1910.
11. *Palaeopsylla klebsiana,* n. sp. By Dr. Alfons Dampf. 12 pp. with two plates. 1910.
12. *Übersicht der Libellen Mittelleuropas* (Libellen-Kalender). By

Wilhelm Leonhardt. Pp. 1–19. (Sonder-abdruck aus dem Entomologischen Jahrbuck für 1911.)

13. *A Preliminary Revision of the Labiduridæ, a Family of the Dermaptera* (Orthoptera). By M. Burr, D.Sc. Pp. 161–203, with two plates. (Ent. Soc. Lond.) 1910.
14. *Dermaptera of Seychelles* (Orthoptera). By M. Burr, D.Sc. Pp. 123–133. Illus. (Trans. Linn. Soc.) 1910.
15. *Note sur la Distribution en Angleterre du Forficula lesnei, Finot* (Orthoptera). By M. Burr, D.Sc. Pp. 121–3. (Bull. Soc. Ent. France.) 1911.
16. *On some South African Dermaptera* (*Earwigs*) *in the South African Museum* (*Cape Town*). By M. Burr, D.Sc. Pp. 17. Illus. (Annals of the South African Museum.) June 15th, 1911.

W. J. L.

Proceedings of the South London Entomological and Natural History Society, 1910–11. With nine plates. Pp. i–xvi. ; 1–175. Published at the Society's Rooms, Hibernia Chambers, London Bridge, S.E.

All but one of the ten papers in this valuable publication treat of entomology. In "The Lepidoptera of a London Garden" (pp. 1–12), Mr. Robert Adkin presents an annotated list of the moths and butterflies he has observed in the garden of his residence at Lewisham since 1880. Mr. Adkin also contributes "Notes on *Hepialus humuli* and its Shetland forms" (pp. 13, 14), in which he protests against the continued use of *hethlandica*, Staud. for the Shetland race of *humuli*, which Newman in 1865 named *thulensis*.

An exceedingly useful contribution by Mr. Alfred Sich is entitled "Larval Legs" (pp. 15–17).

"A Few Days with the Butterflies of Zermatt" (pp. 18–26), by Mr. Hy. J. Turner; "The Butterflies of Sicily" (pp. 27–38), by Mr. J. Platt Barrett; and "An Entomological Trip to South Brazil" (pp. 54–65, plates iii. and iv.), by Mr. W. J. Kaye, are all very interesting.

A highly important paper by Dr. T. A. Chapman, "On Insect Teratology" (pp. 39–53, plates i. and ii.) must be studied by everyone in any way interested in the subject. Those who incline to the study of our native species of Neuroptera should make a point of reading "The Natural Order of Insects—Neuroptera" (pp. 66–73, plates v. and vi.), by Mr. W. J. Lucas.

In "Notes on the Glow-worm" (pp. 74–76, plates vii. and viii.), Messrs. R. A. R. Priske & H. Main give interesting details concerning the early stages of *Lampyris noctiluca*.

Neuration of Lepidoptera is discussed at some length in the "Annual Address" (pp. 77–93) by the President, Mr. W. J. Kaye.

The plates are from excellent photographs by Messrs. F. N. Clark (i. ii.), E. Dukenfield Jones (iii. iv.), W. J. Lucas (v. vi.). H. Main (vii. viii.), and E. Slip (ix.); all are exceedingly well reproduced.

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FOUR NEW PTEROPHORIDÆ.

By T. Bainbrigge Fletcher, R.N., F.E.S., F.Z.S.

(Published with the sanction of the Inspector-General of Agriculture in India.)

The following descriptions of new Pterophoridæ were drawn up two years ago whilst working through the National Collection of Plume-moths, and, as I have already had occasion to refer to one species under its manuscript name (Trans. Ent. Soc. 1910, p. 141), and since the types are standing in the British Museum Collection under the names then given to them, it seems desirable to publish the descriptions.

The first three species have been placed more or less provisionally in the genus *Oxyptilus*, Z., but there is no doubt that this genus contains at present a very heterogeneous collection of exotic species, and that it will require subdivision in the near future. In the meantime, and until we have a larger knowledge of exotic forms, it seems premature to attempt to break it up, more especially as the number of species contained in it is at present moderate (about thirty).

The fourth species belongs to Walker's genus *Sochchora*, which Mr. Meyrick has regarded (Trans. Ent. Soc. 1907, p. 482) as a synonym of *Platyptilia*, Hb., a view in which I am unable to concur, as *Sochchora*, Wlk., appears to me to be quite a distinct genus, more nearly allied to *Oxyptilus* than to *Platyptilia*.

Oxyptilus erythrodactylus, n. s.

♂. Exp. 15·5 mm. Palpi porrect, rather long; second joint longer than the diameter of eye, rather roughly scaled, slightly expanded apically with a few minute spinous hairs; terminal joint about two-thirds length of second, filiform, acuminate, smoothly scaled, fuscous; third joint and centre of second joint darker. Antennæ dark fuscous lined with whitish. Head fuscous, a slight ridge of scales between bases of antennæ. Thorax fuscous irrorated with blackish. Abdomen fuscous, slightly tinged with reddish-brown, with a slight admixture of whitish scales and considerable admixture of blackish; anal tuft light brown. Fore leg fuscous, irrorated externally with blackish, and narrowly lined on femur and tibia with white. Mid legs and hind legs wanting. Fore wing cleft to about one-half, segments moderately broad; first segment without posterior angle, apex pointed and slightly falcate; second segment as broad at base as first, slightly expanded posteriorly, tornus well marked, termen oblique and concave, anterior angle produced. Reddish chocolate-brown; a few scattered whitish scales along costa from base to just beyond one-half, a few black scales form an indistinct inwardly oblique subcostal bar bordering base of cleft, discal area narrowly suffused between about one-half and one-fourth with whitish-ochreous, giving the appearance of a narrow paler ill-defined streak running inwards from base of cleft to base of wing; first segment at one-third of its length with an ill-defined but rather conspicuous inwardly oblique whitish-ochreous bar extending across segment from costa to hinder margin, and very indistinctly produced inwards along hinder margin to base of cleft, at two-thirds of its length with an indistinct narrow outwardly curved transverse whitish-ochreous bar, the area between these two bars slightly irrorated with blackish; second segment with an indistinct transverse whitish-ochreous bar before one-half of its length. Cilia and costa chocolate-brown, darker exteriorly, lighter opposite bars; on hinder margin of first segment light fuscous, with a few blackish scales especially evident at about one-half, and a slight black scale-tuft at about five-sixths length of segment; on fore margin of second segment fuscous with a few scattered black scales, at anterior angle blackish, on termen fuscous, rather lighter basally (of cilia); on dorsum fuscous, with a few scattered black scales and slight black scale-teeth at two-thirds, five-sixths, and tornus, cilia between the latter scale-teeth blackish. Hind wing cleft from about one-third and from near base; segments linear; dark chocolate-brown. Cilia fuscous; fore margin of third segment occupied on outer third with short closely-crowded black scales, preceded by a few pale scales, area between these latter and base of segment with a few scattered black scales; dorsum with a minute apical scale-tooth, a small triangular black scale-tooth at about three-fourths, and a few scattered black scales between this and base.

One specimen. Transvaal (A. J. Cholmley), 1906/265. The register states that these specimens are from "Transvaal and British East Africa."

This specimen may possibly be a *Tetraschalis* (I have not been able to examine the neuration), but is apparently undescribed.

Oxyptilus stenodactylus, n. s.

♂. Exp. 20 mm. Antennæ long, porrect, extending length of head beyond it, smoothly scaled, fuscous, dark fuscous beneath; second joint about as long as diameter of eye, slightly enlarged apically; third joint as long as second, cylindrical, blunt at apex. Antennæ finely ciliated, dark fuscous, minutely sprinkled with whitish. Head fuscous, greyish on vertex. Thorax fuscous, sprinkled with blackish posteriorly, greyish on patagia. Abdomen whitish at base, posteriorly reddish brown mixed with whitish, and irrorated with blackish, the black scales forming longitudinal black shades and streaks, especially laterally; anal tuft short, fuscous. Fore and mid legs broken. Hind leg reddish brown; tibia white on basal third, slightly dilated at two-thirds and apex with scale-tufts, which each emit a pair of moderate whitish black-tipped spurs, of which the inner are the longer, tibia transversely banded with white at one-half and three-fourths; tarsi dark reddish-brown, joints banded basally with white, bands broadest on first and fourth joints. Fore wing cleft to a little beyond one-half, segments narrow; first segment with subfalcate apex and no posterior angle; second segment very slightly dilated posteriorly, tornus almost obsolete, termen oblique. Colour light reddish-brown; a longitudinal greyish discal shade from base of wing to one-fourth, and prolonged less conspicuously into first segment, a minute black subbasal costal dot, a small black discal dot at one-fourth, dorsal area suffused with blackish fuscous from base to one-fourth; first segment with indications (especially evident on costa) of darker inwardly oblique transverse bars before and beyond one-half, the areas following these spaces lighter, and a few scattered blackish scales; second segment slightly suffused with blackish. Cilia on costa dark fuscous mixed with whitish, before and beyond three-fourths narrowly dark brown, followed by narrow patches of ochreous-whitish, black at and before apex; on hinder margin of first segment dark fuscous, blackish subterminally; on fore margin of second segment dark fuscous, with a few scattered black scales, blackish preterminally; on dorsum dark fuscous, cut with narrow streaks of ochreous-fuscous; on termen with a moderate black scale-tooth beneath anterior angle. Hind wing cleft from about one-third and from near base; segments linear; dark fuscous. Cilia dark fuscous; on dorsum with a large broad black scale-tooth at two-thirds, a small black apical scale-tooth, remainder of dorsum thickly strewn with scattered large black scales.

One specimen labelled "MASHONALAND: H. B. Dobbie: 1903/174." The register gives these specimens as from Mashonaland and Beira.

The very narrow segments of the wings, combined with the long palpi, seem to separate this from *Oxyptilus*. It may possibly be a *Tetraschalis*, but wants the apical scale-teeth on segments of hind wing usually characteristic of species of that genus. As I am unable to examine the neuration, I will not erect a new genus for this species, although such will probably be required.

(To be continued.)

NOTES ON ODONATA OBSERVED IN GREAT BRITAIN DURING THE SUMMERS OF 1909 AND 1910.

By E. R. SPEYER, F.E.S.

AFTER last year's success in dragonfly collecting the expected reaction took place this summer, but not to such a degree as had been anticipated, and a most important observation, *viz.*, a recurrence of *Somatochlora metallica*, Lind., in Sussex, was successfully made.

1. *Sympetrum striolatum*, Charp. — Immature males were taken near Tunbridge Wells, in Sussex, on August 1st and 5th. Except for two specimens captured later in August at Shenley, Herts, the insect was not observed again until October 15th at Oxford, on which date a male was distinctly seen. Yet another was seen on October 21st, at Shenley, Herts, this being the latest date on which I have, with certainty, met with it.

2. *Sympetrum sanguineum*, Müll.—As was pointed out in my notes of last year (1908), I thought I saw the insect near Tunbridge Wells, and this I have proved to be correct, for I took quite a number of males in that locality and a single immature female on August 5th.

3. *Libellula depressa*, L.—Only four specimens were obtained, all from Shenley, Herts, in July. Three were females, one of which deposited a large number of ova in a tube of water after capture; only one, however, appeared to be fertile, and hatched.

4. *Libellula quadrimaculata*, L.—A single specimen (a male) from Shenley, Herts, is the only record I obtained. It was captured on July 19th. The species was not seen near Tunbridge Wells this season.

5. *Somatochlora metallica*, Van der Lind., as stated above, was again observed near Tunbridge Wells, in the same locality as last year (1908). On August 1st a single male was caught and several others were seen, while on August 5th the species was very plentiful, but I failed to obtain a female. All the specimens were mature, and must have been on the wing some time; a vigorous search for nymph-skins was unavailing. On August 8th a few more males were seen, under somewhat peculiar conditions; the incessant rain had caused an abandonment of entomology for fishing, but about four o'clock in the afternoon the rain ceased, and almost immediately afterwards several males were flying over the water. Rain came on again about half an hour later, and they then disappeared as suddenly as they had come. On August 5th a male was seen to settle repeatedly upon a certain dry twig among the leaves of an elm-tree. When thus settled it was almost invisible, and whenever I observed other specimens settle they always chose long grass, where they were also well protected from view.

The second occurrence of *S. metallica* seems to remove, at any rate, some of the doubt as to the permanent residence of the species. An examination of the intestine of a male showed the presence of numerous fragments of the hard parts of small insects; there was no evidence of large prey having been eaten.

6. *Cordulegaster annulatus*, Latr. was rare near Tunbridge Wells on August 1st; only males were seen.

7. *Æschna mixta*, Latr.—A single male was certainly seen at a weir near Marlow, on the Thames, but could not be captured. After flying erratically for a considerable time, it settled on a reed, and I was able to approach near enough to determine its sex and identity. The observation was made on September 11th.

8. *Æ. cyanea*, Müll.—Four nymphs, which I had kept for more than six months, emerged between July 30th and August 8th. The nymphs had been obtained in Shenley. A female was found near Tunbridge Wells, on August 5th, in a very immature condition, with the nymph-case hanging to some grass beneath it. The latter lacked its head.

9. *Æ. grandis*, L.—Several were seen at Shenley, Herts, on August 11th, and several nymph-cases were found clinging to reeds.

10. *Calopteryx splendens*, Harr., was common at Oxford in June. On May 30th a male was caught with a large mayfly in its jaws, half of which it had eaten.

11. *Lestes sponsa*, Hans., was again very abundant near Tunbridge Wells in August. A female captured on August 8th had the sides of the bronze spot on segment 1 of the abdomen resembling that found in *L. dryas*, but the size of the insect and form of the anal appendages point without doubt to its identity with the commoner species.

12. *Erythromma naias*, Hans.—A single immature male was taken on the Cherwell at Oxford, on May 15th. It was found sparingly at Shenley during June and July.

13. *Platycnemis pennipes*, Pall., was common on the Cherwell at Oxford during May and June. It was first observed on May 15th.

14. *Pyrrhosoma nymphula* was common near Tunbridge Wells in August. A female, for the measurement of which I am indebted to Mr. Campion, was only 33 mm. in length, the wing-expanse being 43 mm.

15. *P. tenellum*, L., was not very plentiful near Tunbridge Wells.

16. *Ischnura elegans*, Van der L., was generally abundant at Oxford in May, and at Shenley during June and July; also near Tunbridge Wells.

17. *Agrion pulchellum*, Van der L.—Common on the Cherwell at Oxford in May.

18. *Agrion puella*, L., was found commonly from May to August at Shenley, Herts, on the Cherwell at Oxford, and near Tunbridge Wells.

19. *Enallagma cyathigerum*, Charp., was very plentiful at Shenley in July and August, the blue form of the female being taken on several occasions. The spot on segment 1 of the abdomen of the male showed great tendency to variation in size. The dragonfly was also observed again near Tunbridge Wells in August.

In addition to these, two specimens of *Anax imperator*, Leach, were seen, one at Shenley, Herts, on July 29th, the other (a male) on August 4th, at Framfield, in Sussex.

ODONATA OBSERVED DURING THE SUMMER OF 1910.

Very few Odonata have been observed this season (1910), owing to the small amount of collecting which was carried out.

1. *Libellula depressa.*—Common at Shenley, Herts, on June 26th. A single male was taken at the same locality on July 14th.
2. *Anax imperator*, Leach.—Very common at Shenley on June 26th. The male frequently settled in the grass at the side of ponds. A female was captured ovipositing. Two males were seen on July 14th.
3. *Æschna cyanea.*—A single male on July 14th, at Shenley.
4. *Calopteryx virgo.*—Immature specimens were abundant at Woodstock, near Oxford, on May 28th.
5. *C. splendens*, Harr.—Immature specimens were also abundant in the same locality as the last species.
6. *Erythromma naias*, Hans.—A few were captured at Shenley on July 14th. The insect was common on June 26th.
7. *Pyrrhosoma nymphula.*—A few specimens were obtained, far from water, at Woodstock, on May 28th.
8. *Ischnura elegans.*—Common at Shenley in June and July.
9. *Agrion puella.*—Abundant at Shenley in June and July.
10. *Enallagma cyathigerum.*—Common at Shenley in June and July. A blue female was taken on June 26th.

I was unable to visit the *Somatochlora metallica* locality in Sussex this year, and so I have not been able to make a third observation of the insect.

DESCRIPTIONS OF THREE NEW SPECIES OF *ODYNERINÆ* FROM JAPAN.

By P. Cameron.

Rhynchium brevilineatum, sp. n.

Entirely black, except for a short narrow white line at the eyes opposite the antennæ, and the spurs which are testaceous; the eye incision, face and clypeus, densely covered with longish white pubescence; the ventral surface with shorter pubescence, the back of abdomen with a white silky pile; wings violaceous, the nervures black; the tegulæ black and shining. Clypeus a little longer than wide, the apex with a shallow rounded incision; sparsely, distinctly, but not strongly punctured; the upper part of the head and thorax much more strongly and closely punctured, the post-scutellum coarsely rugosely punctured, its apex obliquely narrowed from the sides to the middle, which is bluntly rounded. Apex of metanotum smooth, sparsely punctured round the edges, the middle below with a triangular transversely striated band; the sides bluntly rounded, without teeth. Base of metapleuræ smooth above, sparsely punctured below, the rest irregularly longitudinally striated. Propleuræ coarsely punctured above, below irregularly slightly obliquely striated. Mesopleuræ closely, deeply, strongly punctured ♂. Total length 15 mm.

Base of pronotum transverse, narrower than the head. Post-scutellum very slightly raised above the level of the flat scutellum. Sides of metanotum at the base reticulated. Basal segment of abdomen large, cup-shaped, not much larger than the second. Antennal hook, slender, reaching to the base of the eleventh segment.

Allied to *R. argentatum*, *metallicum*, and *maldivense*; it wants the dense white silky pile and the white mark on the top of the clypeus of these species; it is larger and stouter than most of the examples I have seen of them, the post-scutellum is more distinctly, gradually narrowed from the base to the apex, the base of the thorax is more sharply transverse and the punctuation is stronger.

Rhynchium fukaii, sp. n.

Rufo-testaceous, the clypeus, a large mark twice wider than long, transverse above, broadly rounded below on the lower part of the front and a line on the lower part of the eye incision, lemon-yellow; the following parts are black: the face and the part between the antennæ, the front except along the eyes, the lower outer part sharply projecting towards the eyes, roundly narrowed above and enclosing the lower ocellus, the part enclosing the ocelli, except for a curved line outside the ocelli; the occiput, the outer edge of the outer orbits, the inner more narrowly, a broader oblique line, uniting the two at the top of the eyes, the base and apex of mesonotum broadly, more or less of the sides, the metanotum wholly or in part, the greater part of the pleuræ, the mesopleuræ with a large pyriform, rufous spot at the base above, the greater part of the basal two abdominal segments, the line on the second narrowly laterally, the base of the third and fourth and the basal three or four ventral segments, black. Legs coloured like the body, all the coxæ and trochanters, the base of the four anterior femora and the hinder entirely black. Wings rufous hyaline, the apex violaceous. ♂. Length 14 mm.

Clypeus longer than wide, broadly rounded above, the apex with a slight but distinct incision. Front and, to a less extent, the vertex, densely covered with fuscous pubescence. Apex of post-scutellum broadly rounded. Apex of metanotum closely, somewhat strongly obliquely striated, the sides margined above, the middle with a large upper and a smaller lower spine. The apices of the abdominal segments are more strongly punctured than the base, especially the middle ones, which have the apices depressed, with the extreme apex slightly reflexed.

Allied to *R. hæmorrhoidale*; it has the puncturation stronger and closer; the clypeus wider compared with the length, the head markings are different and there are only two spines on the sides of the metanotum.

Ancistrocerus densepilosellus, sp. n.

Black, the clypeus, labrum, middle of mandibles irregularly, under side of antennal scape, a line on apex of pronotum, one on the apices of the basal four abdominal segments above and on the basal two below, the basal dorsal two narrowed laterally, the line on second ventral widened laterally, the apices of the femora narrowly and the greater part of the tibiæ and tarsi, pale yellow; wings hyaline, the stigma fuscous, the nervures darker coloured. Tegulæ black. Head and thorax densely covered with moderately long pale pubescence. ♂. Total length 8 mm.

Clypeus as wide as long, transverse above, the apex with a distinct semicircular incision. Antennæ thickened towards the apex, the apical two joints brownish beneath, the hook of moderate thickness, reaching to the base of the joint. Base of thorax transverse, with acute projecting angles. Post-scutellum more obliquely sloped than the scutellum. Sides of metanotum bluntly margined. The second abdominal segment is longer than it is wide at the apex; the apices of the segment flat, not strongly punctured.

Ancistrocerus apiciornatus, sp. n.

Black, the apices of the abdominal two basal segments, a short line on the sides of the apex of the second ventral, the clypeus in the male, a line on the base below on the antennal scape in the male and the greater part of the four front tibiæ and tarsi, the base of the hind tibiæ and the basal joint of the hind tarsi, pale yellow; wings highly iridescent, violaceous on apical half, the stigma and nervures black. Apical joints in male antennæ brownish below, thickened, without a hook. Female clypeus a little wider than long, its apex slightly depressed in the centre, shortly, bluntly tuberculate laterally. Clypeus in male a little wider than long, its apex with a rounded, shallow incision. ♀ and ♂. Total length 7 mm.

A slender, narrow species. Shining, densely covered with short white pubescence. Base of thorax transverse, raised. Parapsidal furrows distinct. Scutellum with a wide furrow which does not reach the base or apex; it is widened towards the apex, the apex itself being acutely pointed. Post-scutellum with a curved furrow in the middle, the base more strongly punctured than the apex. Sides of metanotum broadly rounded, closely reticulated. Upper apical two-thirds of propleuræ irregularly striated-punctured; meso- and metapleuræ smooth, the former more shining than the latter. Basal segment of abdomen strongly punctured, the apical longitudinal furrow long and deep.

The three species described above were sent to me by Mr. T. Fukai, Secretary of the Entomological Society of Japan, of Konosu, Saitama.

NOTES ON THE VARIETIES OF *PERONEA CRISTANA*, FAB., LATELY IN THE COLLECTION OF THE LATE J. A. CLARK; WITH A REVISION OF THE NOMENCLATURE.

By Sydney Webb.

(Continued from vol. xliii. p. 268.)

Cristana, Group a., Addendum.

Nigropunctana, Clark.—Similar to *proxanthovittana*, as now determined, but the central tuft is large and dark brown, instead of fulvous. South (*in litt.*) is of opinion that *nigropunctana*, Clark, and *fulvostriana*, Desv., are referable to the *striana* group, and states that the former only differs from the latter in having a more complete fulvous streak on the inner margin. He regards *fulvostriana* as a form intermediate between *striana*, Haw., and *nigropunctana*, Clark.

Desfontainana Group.

Fulvous dash along centre of wing from the base to the fulvous button.

[*Albovittana*, Steph.—White head and thorax, white vitta.

Fulvocristana, Steph.—Yellow head and thorax, ochreous vitta.

Consimilana, Steph.—Vitta consisting of approximating ashy lines.

Desfontainana, Fab.]

Sericana, Hüb. nec Dup.—Similar to *desfontainana*, but no central tuft; or, if it be present at all, it is extremely small. No vitta.

Ulotana, Clark.—Bluish black. Vitta two striate ashy lines below the deep rusty red central streak, which terminates in the similarly coloured large central tuft. Apparently quite distinct, but in the specimen Clark took for his type the vitta is entirely absent. In his series the two forms are about equally divided in numbers. That with vitta appears to agree with *sericana*, Dup., but the latter name had already been adopted by Hübner for another form; it must therefore be dropped in favour of the later one of Clark's, which will include both modifications of the form, unless we name the striated one *flammeana*.

Cristalana Group.

Much variegated with light and dark brown, occasionally with white markings, or yellow vitta.

[*Subcristalana*, Curt.]

Sequana, Curt.—Our series of this insect are generally much mixed. Curtis copied his description from a manuscript of Bentley, who wrote thus: "Similar to last [*fulvovittana*, Steph.] but smaller, and having no white in the superior wings, which are purplish brown and variegated. An angulated brown space at the base spotted with black, button large and ochreous at the apex, with a short black streak beyond it, the semiloop on the costa purplish grey, apex lead-coloured, inner margin ochreous; palpi, head, and centre of thorax pale ash colour."

Subfulvovittana, Clark.—Identical with *fulvovittana*, Steph., but the pale lunar crescent on the costa ends abruptly at the central tuft, and is never continued upwards to join the costa beyond it.

[*Cristalana*, Don., and the same form with the addition of a fulvous vitta—*fulvovittana*, Steph.—are both well known.]

Procristalana, n. ab.—Like *subfulvovittana*, Clark, but without vitta. Button light brown, changing to dirty white on its inner side, where the white fascia from the costa blends into it.

Chantana Group.

Upper part of wing chestnut-brown.

[*Chantana*, Bent.—Well-defined and equally well known.]

In lots 318 and 319, at Clark's sale, were four specimens of a modification of *chantana* with dark button. These were accepted by Clark as *albostriana*, Haw., which we all know to be one of the forms of *Peronea hastiana*. Having long had the same insect in my cabinet, labelled *postchantana*, we may, I think, call it by that name for want of a better. It differs from *prochantana* by the large black tuft upon the primaries.

Prochantana, Clark, which had been for many years in cabinets mixed with *chantana*, is buttonless and easily distinguishable.

Subchantana, Clark.—May be compared with *subvittana*, Steph., with pale ochreous button. It appears, however, very distinct, and certainly belongs to this group. The fine ashy line along the fold from the basal blotch to the hind margin is not shown in Clark's figure of this form.

Vaughaniana, n. ab.—Light brown with a purplish gloss, the upper part of the wing rufous, a dull red streak from the central tuft to the costa before the apex. Button extremely small, almost wanting, brown; palpi, head, and thorax ash-coloured, an ash-coloured line along the fold to the hind margin, generally consolidated into an ashy grey patch at the extreme base of the inner margin, similar to that of *subchantana*, but not so pale. I dedicate this moth to the memory of my late friend, Howard J. Wright Vaughan, who took a keen interest in the "buttons," and was the first British entomologist to appreciate the importance of collecting local races and the varietal forms connected with them.

VITTANA GROUP.

Upper part of wing chestnut-brown, button dark, vitta orange or composed of striate lines.

[The type *vittana*, Steph., is well known, and no comment upon it is necessary.]

Intermediana, Clark. — The specimen Clark made his type has a somewhat paler vitta than the form *vittana* of Stephens; there are two similar specimens in his series, and three in Bond's, all of which are identical. The remainder of Clark's series are normal *vittana*. This varietal name is therefore of but little value.

Spadiceana, Haw.—A well-known form. From the coloration of its wings it is placed in this group, otherwise the vitta being made up of dull and inconspicuous ashy grey lines, its affinity to the *striana* group in this respect is at once apparent.

Substriana, Steph.—An altogether darker insect, with the chestnut costal portion much obscured. A well-known form. It has no affinity with the *striana* group, in spite of the name.

PROFANANA AND SEMIUSTANA GROUP.

More or less mottled wings, black or very dark brown tuft.

A. *No vitta.*

[*Profanana*, Fab.—Well known, as is also *semiustana*, Curt.]

B. *Vitta orange to palest yellow or white.*

[*Provittana*, Desv.]

Flavostriana, n. ab.—In Bond's cabinet are three, in Clark's one, and I have seen others; of lightly mottled specimens easily distinguished from the last. The vitta is distinct and white, tinged along the middle with the faintest yellow. Head and thorax pale cream. I propose for this variety the above name, which was written on the ticket placed by Bond below his specimens.

A form wanting a name is similar to *bentleyana*, Curt., but the head and thorax are white, palpi cream. The large central tuft and vitta pure white. Several specimens have been taken in the New Forest. A very handsome insect.

Another form, somewhat like the last, but the paler blotches upon the wings almost obliterated by the dark ground colour. Head, palpi, and thorax cream, large button, some subsidiary small tufts of raised scales towards the ends of the wings, and vitta cream. Epping Forest and Folkestone. Can this be Duponchel's *combustana*? It may well be, although the mottled appearance of the wing places it in this group rather than in that of *cristana*.

[*Bentleyana*, Curt.]

Semistriana, Desv.—An extremely rare form akin to *semiustana*, but with distinctly striated grey inner margin.

(To be continued.)

NEW AFRICAN GEOMETRIDÆ.

By Louis B. Prout, F.E.S.

Subfam. Acidaliinæ.

Mnesithetis ornithospila, sp. n.

♀, 22 mm. Face and palpus reddish. Fore coxa and femur marked with red above. Thorax above concolorous with wings. Wings pale olive-green, lines darker olive. Fore wing with faint curved antemedian at just before one-third, distinct postmedian at beyond two-thirds, not at all denticulate, sinuate inwards below M^{1}; cell-mark elongate, dark olive; terminal line little darker than ground colour, followed by a pale line at base of fringe; fringe long, concolorous with wing, slightly paler in distal half. Hind wing without the antemedian line, cell-mark white, not broken up into two spots, but forming an angulated mark nearly as in the Hemitheine genus *Ornithospila*. Under side ochreous whitish strongly flushed with flesh-pink; both wings with very faint traces of the postmedian line, otherwise unmarked.

Bitye, Ja River, Cameroons. Type in coll. L. B. Prout.

Differs from typical *Mnesithetis* in having sc^{2} of fore wing arising from the cell instead of from the stalk of sc$^{3-5}$. Will form a new section, if not a new genus.

Acidalia fuscifusa, sp. n.

♀, 26 mm. Face fuscous. Palpus brown, tipped with fuscous. Legs light brown, fore leg fuscous on inner side. Thorax fuscous dorsally. Fore wing light brown; basal half (to median shade) irrorated and irregularly clouded with fuscous, especially towards inner margin; antemedian line obliterated; median shade diffuse, curved (parallel with termen), passing just outside the discal dot; postmedian line dark fuscous, denticulate on the veins, from three-fourths costa, slightly oblique outwards to R^{1}, there sharply angled, incurved between R^{1} and R^{3}; terminal area fuscous, excepting a patch at costa, the edge of the fuscous shade sloping away from R^{1} to just below apex; discal dot small, black; terminal line blackish, interrupted at the vein-ends. Hind wing elbowed at R^{3}; similar to fore wing, the median shade proximal to the cell-spot, postmedian less sharply angled at R^{1}. Under side of fore wing similar to upper but less strongly mixed with fuscous; of hind wing free from fuscous admixture only, the lines and cell-spot present.

Bitye, Ja River, Cameroons. Type in coll. L. B. Prout. A second example, from Uganda, in coll. Brit. Mus.

Perhaps related to *Acidalia diffusizona*, Hampson, Proc. Zool. Soc. Lond. 1910, 478 (*Craspedia*).

Subfam. LARENTIINÆ.

Onychia olbia, sp. n.

♀, 30–32 mm. Head and body (with palpus, antenna, &c.) ochreous, more or less mixed with pink, and finely irrorated with darker scales. Palpus long. Antennal ciliation slightly longer than in the typical members of the genus, but lacking the longer bristle at end of each joint. Fore wing with costa slightly more arched than is typical, termen slightly more oblique, rather straight; bright yellow ochre, somewhat mixed with browner scales, and traversed by numerous wavy lines; two in basal patch brown, accompanied by one or two weaker; three in intermediate area, more reddish and very much fainter; three (brown) in the proximal and three in the distal part of the rather broad median band, the proximal three slightly and the next two markedly angled below costa, the sixth (margining the band distally) dentate inwards on SC^5, bluntly bilobed on either side of M^1 and gently incurved anteriorly and posteriorly to these lobes, accompanied distally throughout by a very fine white line; two in the outer intermediate area reddish, strongly lunulate-dentate, the proximal one much interrupted; median band much clouded with pink, leaving costal, central and inner marginal patches more or less of the ground colour; terminal area darkened, being composed of a blend of ochreous, fuscous and pink scales, a few vague whitish spots on veins indicating the position of the subterminal line; discal spot blackish, elongate, closely following the third median line; terminal line olive-brown, interrupted at the vein-ends; proximal half of fringe concolorous with terminal area, distal half whitish mixed with pink, the halves separated by a thick olive-brown line. Hind wing silky whitish, with a very few brown scales, some slight pinkish marks on inner margin, and a fine, sinuous, brown postmedian line from inner margin at three-fourths, fading out beyond R^2; cell-spot weak, small; terminal line as in fore wing; fringe pinkish. Under side of fore wing dirty whitish, irrorated with brown; base, costal and distal margins darker, apical area more broadly so; a brown spot on costa before one-fourth (midway between basal and median bands of upper side); cell-spot strong, elongate, followed by three brown lines, the first two nearly straight, the third darker, angled on R^3. Under side of hind wing more uniformly mottled with the ochreous, olive-brown and pink scales, palest between postmedian line and terminal area; cell-spot and postmedian line much darker and stronger than above, the latter reaching across wing; fringe concolorous with terminal area.

Near Johannesburg (Edmund A. Bacot). Type and a precisely similar but somewhat worn female in coll. L. B. Prout, kindly presented by Mr. A. Bacot.

Probably nearest to *Onychia arenaria*, Warr., Nov. Zool. ix.

518 (*Plerocymia*). The generic name *Plerocymia*, Hüb., is purely a synonym of *Larentia*, Tr.; its type (*clavaria*, Haw., = *cervinata*, Schiff., nec *cervinalis*, Scop.) has biangulate DC in the hind wing, which is not the case with the present genus.

Onychia (?) *lamprammodes*, sp. n.

♀, 30 mm. Head, body and tip of palpus whitish, irrorated with sandy and fuscous; palpus otherwise sandy, irrorated with fuscous; abdomen beneath strongly mixed with sandy; thorax in front with a narrow fuscous bar. Fore wing narrow, costa nearly straight, slightly convex basally and distally, faintly concave between; whitish ochreous, almost entirely covered by bright sandy ochreous markings, costal edge slightly darker to SC (excepting apical end); markings consisting of about twelve, mostly ill-defined lines, running obliquely from inner margin; the first four (proximal to the discal dot) acutely angled in cell, the fourth (indicating the commencement of a slightly darkened, more reddish ochreous median band) marked with fuscous at inner margin and on M at origin of M^2; the next four nearly straight, the eighth conspicuous, forming the distal boundary of the central fascia, and followed by a fine pale line; the next two also nearly straight, in a pale band which runs to costa at apex, last two virtually coalesced into a narrow band; cell-spot minute, black; terminal line fuscous, broken up into spots; fringe concolorous with termen. Hind wing narrow, costa long, apex rounded, prominent, termen slightly sinuous, scarcely convex; nearly concolorous with fore wing, slightly less bright, base and a postmedian band whitish, the intermediate area blurred, with a confused suggestion of four transverse lines; a diffuse, sandy ochreous subterminal band; cell-spot, terminal line and fringe nearly as in fore wing. Under side blurred sand-colour, finely (the hind wing more coarsely) irrorated with darker; both wings with ill-defined pale postmedian band and small dark cell-spot.

Near Johannesburg (Edmund A. Bacot). Type in coll. L. B. Prout, presented by Mr. A. Bacot.

Affinities somewhat doubtful, perhaps nearest to "*Plerocymia*" *albiclausa*, Warr., Nov. Zool. iv. 236. The shape and pose of markings superficially recall a narrow-winged specimen of *Horisme* (e. g. *minuata*, Walk., or especially *aquata*, Hüb.), but the abdomen is not crested; DC^3 of the hind wing is extremely oblique, and C anastomoses to very nearly the end of the cell.

Subfam. GEOMETRINÆ.

Ectropis (?) *amphitromera*, sp. n.

♀, 36 mm. Head and body brown mixed with fuscous, abdomen with paired black dorsal spots. Palpus quite moderate, stout. Fore and middle legs mostly fuscous, pale at ends of joints (hind legs lost). Fore wing moderately broad, apex blunt, termen faintly waved; ochreous brown coarsely irrorated with fuscous; markings dark fuscous; antemedian line obscure, placed and bent as in *delosaria*, Walk.; an obscure, slightly curved median shade crossing the cell-spot, which is rather large and oval, but not pale-centred; postmedian line from two-thirds costa, nearly parallel with termen, slightly incurved between M^1 and SM^2, lunulate-dentate, the teeth pointing distad and thickened; subterminal line pale, ill-defined, interruptedly lunulate, the lunules filled in proximally with fuscous, those on either side of M^1 the largest and whitish; terminal lines consisting of a series of black crescentic dashes, well separated by the veins. Hind wing with the median shade becoming antemedian, passing well proximally to the cell-spot, which is somewhat smaller than in fore wing; postmedian, subterminal and terminal lines as in fore wing. Under side similarly coloured, the fuscous irroration somewhat more irregular, denser in the entire distal area. Fore wing with antemedian line obsolete, median shade weak, cell-spot as above, postmedian thick, diffuse, accompanied distally by an ill-defined pale shade, which thickens on inner margin; subterminal line almost obliterated, excepting a rather large pale spot anterior to, and a small one posterior to M^1. Hind wing similar, the pale dentate postmedian shade somewhat better defined.

Near Baringa, Lulongo River, Congo, long. 21° E. (Rev. E. Cartwright). Type in coll. L. B. Prout, kindly presented by Mr. G. R. Baldock.

Upper side somewhat as in *Ectropis delosaria*, Walk. (= *crassa*, Warr.), colour brighter brown, discal spots not ocellated, build somewhat more robust; under side quite different from that species. Venation agreeing—sc^{1-2} of fore wing long-stalked, arising from cell and not separating till well distad to the separation of sc^5 from sc^{3-4}.

NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 272.)

Boarmia griseoviridata, sp. n.

♂. Fore wings greenish grey, finely powdered with blackish; antemedial line blackish, slender, indistinct; postmedial line blackish, dotted with black on the veins, outwardly edged with paler; between postmedial line and the black discal spot is an irregular line, black and serrate towards the costa, sinuous and blackish below the cell where it approaches the postmedial; subterminal line pale, sinuous, marked with black at apex, between veins four and six and above dorsum; termen with black dots more or less connected by a slender black line; fringes brownish. Hind wings agree in colour with fore wings; discal spot and postmedial line black, the latter indicated by dots on the veins, otherwise indistinct; subterminal line pale, inwardly edged with blackish; termen crenulate, dotted with black between the veins; fringes brownish. Under side pale brownish, all the wings have a black discal dot, and traces of a postmedial line.

♀. Similar to the male, but the subterminal line of all the wings broadly bordered with purplish brown; the dorsum of fore wings is also purplish brown from the subterminal line to the base of the wing.

Expanse, ♂ 50–52 millim., ♀ 48 millim.

Collection number, 1544.

Two male specimens and one female from Kanshirei (1000 ft.), 1908. One of the males is paler in colour than that described, and the transverse lines are less distinct; it was taken in March, the type male in July, and the female in May.

Alcis subpunctata, sp. n.

♂. Fore wings greyish white, powdered with brownish and sparingly sprinkled with black scales; antemedial line black, slender, dotted with black on the costa and the median nervure; postmedial line black, finely toothed below costa, and indented above dorsum; discal mark lunulate, the lower cusp touching the postmedial line, and the upper cusp connected by dark scales with a black spot on the costa: a series of elongate black spots on termen. Hind wings slightly paler, with blackish discal spot; postmedial line blackish, curved and recurved, terminating in a black spot on dorsum, irregularly toothed on the veins; termen marked as on fore wings; traces of a white subterminal line towards tornus. Under side as above but paler, and the markings generally less distinct; discal spot on hind wings more conspicuous.

Expanse, 34 millim.

Collection number, 802 A.

A male specimen in rather poor condition from Rantaizan (7500 ft.), May 9th, 1909.

Alcis nigronotaria, sp. n.

♂. Pale greyish brown, with a black, rather large, discal spot on each wing; ante- and postmedial lines of fore wings black; the former indented below costa, thence inwardly oblique to dorsum; the latter irregularly toothed, almost parallel with termen; space between the lines slightly paler. Postmedial line of hind wings black, slightly curved outwards beyond the discal spot, and inwards below the discal spot; the basal area somewhat paler. Under side similar to upper but paler, lines less distinct.

Expanse, 33 millim.

Collection number, 802.

A male specimen from Tainan, April 20th, 1906.

Alcis fulvipicta, sp. n.

Basal and outer areas of the fore wings brownish, mottled and clouded with darker; medial area whitish, mottled with greyish brown, and with a band-like tawny cloud along its outer limit; ante- and postmedial lines indistinct, the former obscured by the clouding on basal area, and the latter represented by blackish marks; subterminal line whitish, serrate, inwardly edged with blackish; a blackish spot at end of the cell, its inner edge black; three black bars on outer area towards costa, and two similar bars near dorsum, are interrupted by the whitish subterminal line. Hind wings whitish, mottled with brownish except on costal area; discal dot blackish; postmedial line indicated by dusky dots; a blackish dot at tornus and one beyond it on dorsum. Under side whitish, the dark markings somewhat as above on the fore wings, but discal dot and postmedial line of hind wings more distinct than on the upper side.

Expanse, 37 mm.

Collection number, 805.

A male specimen from Rantaizan (7500 ft.), May 11th, 1909, and a female from Arizan (7500 ft.), September 11th, 1906.

Allied to *A. eurydiscaria*, Hampson.

Episopthalma taiwana, sp. n.

♂. Green, with an ochreous ringed blackish spot on each wing; antemedial line of fore wings rather darker, inwardly edged with paler, crenulate; postmedial line darker, outwardly edged with paler, almost whitish, serrate; traces of a pale crenulate subterminal line. On the hind wings there is a serrate, curved line beyond the discal spot, this is blackish towards costa; the costal area tinged with pinkish brown from line to base of the wing. Fringes pinkish brown, preceded by darker crenulate line. Under side leaden grey, all wings with dusky postmedial line; costa of fore wings ochreous.

♀. Similar to the male, but the edges of transverse lines whiter.

Expanse, ♂ 46 millim., ♀ 48 millim.

Collection number, 1547 A.

One example of each sex from Kanshirei (1000 ft.); the male captured May 2nd, and the female July 10th, 1908.

This species is very like *Chlorodontopera chalybeata*, Moore, but the antennæ are almost simple in both sexes; the margins of the wings are less crenulate, especially those of the fore wings.

BY THE WAY.

Since Spence wrote Letter xxv. of the 'Introduction to Entomology,' we can recall no claim made to *ignes fatui* as an entomological subject. He distinctly states, however, his expectation that luminous insects would be discovered to be the explanation of the phenomenon, and regards the phosphureted hydrogen theory as impracticable on account of the light's erratic and local movements in a high, steady breeze. Personally, we have (with Wailes) vaguely supposed it to be "the spontaneous ignition of gaseous particles" given off by decaying vegetable matter. But the only person who has ever "knocked down" a will-o'-the-wisp—at Ickleton, Cambs, in 1780—found *Gryllotalpa*! A recent writer in 'Country Life' brings forward a very different explanation, pointing out that Linné probably named the barn-owl *Strix flammea* on account of the occasional luminosity of its breast-feathers, caused (thinks Lydekker) by "their plumage having come into contact with phosphorescent bacteria developed in the decaying wood of their nesting resorts." But jack-o'-lanterns are not found in farmyards, and even a Cambridge yokel of 1780 knew a barn-owl from a mole-cricket!

Commercial Science rises to great heights with the United Staters. We have received a 'Price List of Philippine Insects in the Collection of the Bureau of Science, Manila, P. I.,' which we suppose to be an official emanation, since no dealer's name is blazoned forth. The prices are very definite, and nicely printed on creamy paper, and one is given the family name of each species free. They seem to possess many insects, but only one stands under Ichneumonidæ; this is "*Megischus tarsatus*," and will cost you a dollar, but *Megischus*, Brullé (1846), is a mere synonym of *Stephanus*, Jur. (1807), the typical genus of the Stephanidæ, and not an ichneumon at all—*bursa non caput*! At the same time came 'Insects and Disease,' by R. W. Doane, A.B., Assistant Professor of Entomology, Leland Stanford, Junior, University; it is described as a popular account with original illustrations. The text seems, like Hamlet, "made up of quotations." The Thirty-fourth Annual Report of the Lancashire and Cheshire Entomological Society shows it a thriving institution with a good balance behind it.

The views of Professor Perrier, of astronomical fame, respecting the entomology of Mars read like the more extravagant of Miss Budgen's 'Episodes of Insect Life.' Owing to the lesser gravity, jumping animals would predominate; the great extremes of seasonal temperature would produce "quick-living" creatures, which complete their active life in a single season, such as butterflies. Flowering plants would grow in abundance, and the six-hundred-and-sixty-eight-day-year points to "intense growth and reproduction, immensely tall grasses, huge fruit, and gigantic insects. As life is a greater struggle there, the writer is led to assume a high plane of intelligence in Martian insect-life. He imagines the wisdom of a thousand ants resident in the brain of one great Martian blackbeetle." With us a sufficient number of such Blattæ in England would probably place the "Back to the Land" theory within practicable politics, for (as few town-dwellers realize) there are no cockroaches in the country.

Survey parties, consisting in the entomological section of officials from both Edinburgh and Dublin Museums, as well as private collectors, have again been investigating the fauna and flora of Clare Island and the adjacent mainland of Co. Mayo this season. The weather has been unusually anticyclonic for that district, and the bays very full. The Survey will end with the present season, and Mr. R. Ll. Praeger, of the Dublin Library, will be glad of English assistance on Clare during the autumn.

C. M.

NOTES AND OBSERVATIONS.

STERRHA SACRARIA IN SCOTLAND.—I have pleasure in recording the capture of a female specimen of *Sterrha sacraria* on August 18th. My boy saw the moth flying in the afternoon over a patch of grass near my house. Being without a net, he caught it with his hand, consequently the specimen was not in cabinet condition.—L. G. ESSON; 376, George Street, Aberdeen.

LIMENITIS SIBYLLA (LEPIDOPTERA) IN SURBITON.—Dr. R. N. Goodman tells me that he found a "White Admiral" on a gravel walk on Surbiton Hill, on July 8th last. Of course this may only be an escape, but it seems well to record the occurrence, as the species has been found in several places in Surrey of late years.—W. J. LUCAS; Kingston-on-Thames.

COLIAS HYALE IN SOUTH WALES.—A specimen of *Colias hyale* was taken on the sandhills near Porthcawl, one day last week, by Mr. David Nicholl, of Laleston House, Bridgend.—(Mrs.) M. D. B. NICHOLL; The Cottage, Merthyr Mawr, Bridgend, August 21st, 1911.

COLIAS HYALE (LEPIDOPTERA) IN THE ISLE OF WIGHT.—Mr. E. A. C. Stowell tells me that he took five examples of this butterfly out of one clover-field at Freshwater, August 12–13th last. Since then he saw no others there, or elsewhere, in the island.—W. J. LUCAS; Kingston-on-Thames.

COLIAS HYALE IN BUCKS.—On the 14th inst., while crossing a grass field near Bourne End, Bucks, I saw a specimen of *Colias hyale* settle on a solitary flower-head of clover. Unfortunately I had not my net with me, but after a little careful "stalking," I managed to secure it under my hat! It is a perfect male.—E. S. A. BAYNES; 120, Warwick Street, S.W., August 16th, 1911.

COLIAS HYALE NEAR NORWICH.—On August 7th I had the good fortune to capture a specimen of *Colias hyale* at Hellesdon, near this city. It was taken flying over a patch of lucerne, and is a fine male in perfect condition.—ROBT. LADDIMAN; 25, Drayton Road, Norwich, August 23rd, 1911.

COLIAS EDUSA AND C. HYALE IN SUSSEX AND OXFORDSHIRE.—Commander J. J. Walker informs me (August 23rd) that his nephew, Mr. H. G. Champion, has been taking both species at Shoreham, Sussex. Also that he saw a fine male *C. hyale* at Weston-on-the-Green, near Summertown, Oxford, on August 16th. — RICHARD SOUTH.

SPHINX CONVOLVULI AT DULWICH.—I have just taken a fresh specimen of *Sphinx convolvuli* in our front garden here.—GEO. S. ROBERTSON; St. Anne's, 101, Thurlow Park Road, Dulwich, S.E., August 24th, 1911.

SPHINX CONVOLVULI IN KENT.—I should like to record the capture of a fine female *Sphinx convolvuli* at rest on a fence in this district, on August 15th, 1911.—ETHEL M. MORGAN; 24, Queen's Road, Tunbridge Wells, August 15th, 1911.

SPHINX CONVOLVULI IN CAMBERWELL.—A very fine female specimen of *Sphinx convolvuli* was brought to me this morning, taken by Mrs. Jaggers, 5, Mosedale Street, Datchler Place, Church Street, Camberwell, in the early morning at rest on a jacket that had been left hanging on a line to dry all night.—C. HUDSON; 263, Camberwell Road, London, S.E., August 25th, 1911.

NONAGRIA SPARGANII IN SUSSEX.—I should like to record the capture of *N. sparganii* near Seaford, Sussex. Working with Mr. P. C. Reid and Mr. W. E. Nicholson on the 24th ult., between us we took seven pupæ of this species, and so far I have bred three imagines.—FRANCIS C. WOODBRIDGE; The Briars, Gerrards Cross, Bucks, August 2nd, 1911.

CAPTURE OF CHRYSOPHANUS PHLŒAS VAR. SCHMIDTII.—My daughter, Miss Gwendoline Nurse, captured a specimen of the above in fair condition on August 11th, at Dolgoch, Towyn, Merioneth. It is similar to the one figured on Plate 101, No. 7, in South's 'Butterflies of the British Isles.'—(Rev.) E. J. NURSE; The Rectory, Windermere.

ARGYNNIS LATHONIA IN GUERNSEY.—I should like to record the capture, on August 7th, in Guernsey, of a perfect female specimen of *Argynnis lathonia*. The capture was made about noon in a lucerne field bordering on the sea.—H. G. LEKAY; 11, Wontner Road, Upper Tooting Park, London, S.W.

CATEREMNA TEREBRELLA IN EAST DEVON.—It may be of interest to record that my colleague, the Rev. J. S. Martin, bred in July a specimen of *C. terebrella* from a spruce cone collected with others near Ottery St. Mary, Devon. This seems a far cry from the home of the species in Norfolk. I have for several years collected the cones from the same spot in order to breed *strobilella*, but have unfortunately thrown them away as soon as the Tortrix emerged.—JOHN W. METCALFE; Ottery St. Mary, July 31st, 1911.

Dates of Emergences of Certain Butterflies in 1911.—It may be of interest to record the dates of emergences of some of the butterflies in this neighbourhood during the present abnormally hot summer:—*Lycæna minima*, most abundant but very worn, June 15th. *Epinephele tithonus* (males only), very plentiful, July 5th. *Adopæa lineola* (males principally), most abundant, July 7th; this species had apparently been out quite a week. *Cyaniris argiolus*, second brood, a large and fine form quite plentiful in my garden, July 8th. The larvæ were not uncommon up to the end of June, feeding on young holly *leaves*.—A. H. Jones; Shrublands, Eltham, August 19th, 1911.

Note on Amphidasys betularia, Tephrosia biundularia, and Trichiura cratægi.—I have reared over forty specimens of *Amphidasys betularia* this season from ova deposited by a female intermediate between the type and ab. *doubledayaria*. I find that the percentage of males and females is exactly equal. Is this not rather unusual? Also on May 16th, 1910, I went to "Pamber Forest," Hants, and among the insects I took was a female of *Tephrosia biundularia* closely approaching if not quite identical with ab. *delamerensis* as shown in 'Moths of the British Isles,' Plate 136, Fig. 8. I kept it alive for ova, of which it laid about thirty, and from these moths were duly reared. The pupæ were kept out of doors all the winter. The moths, twenty-two in all, emerged between April 19th and May 13th, 1911. Eleven (seven males, four females) are like Fig. 6, Plate 136, while the other eleven (eight males, three females) *very closely* approach Fig. 8, Plate 136. On September 19th, 1910, I took a specimen of *Trichiura cratægi* on a lamp at Reading in grand condition. I think this species is rather scarce in this locality?—H. L. Dolton; 27, Brunswick Street, Reading, July 10th, 1911.

Hybernation of Pyrameis atalanta.—In reply to Mr. Frohawk (p. 248), I really have no "views" on this question, and should be sorry to dogmatise on the little knowledge I possess of the habits of *P. atalanta*. Before, however, accepting as proved the theory that *atalanta* in Britain is due entirely to immigration, we need considerably more proof than either Mr. Newman or Mr. Frohawk has given us. Like other species, this may hybernate, either as (1) imagines: Mr. Newman's experiments in artificial heat hardly disprove the possibility; (2) ova: some of the late summer ones may not hatch till spring; (3) larvæ: the full-grown ones mentioned by Mr. Frohawk in October may—some of them—outlive the winter in that state; or they may as (4) pupæ tide through the winter. I would point out that purely negative proof is not sufficient; suppose, for instance, that only one out of a thousand *atalanta* hybernated in one of its forms, it would still be quite as adequate to account for its distribution as a few specimens blown over from France. Supposing the above four possibilities disposed of, there still remains the difficulty, which Mr. Frohawk has not attempted to explain, that North French conditions are no more favourable to hybernation than English ones, and that, therefore, if hybernation in England is ruled out, so it must be with North France. Personally, it seems to me much more probable that hybernated imagines from Cornwall should renew the *atalanta* population of England than that they should come all the way from the warmer parts of Europe; but, as already pointed out, neither hypothesis is necessary, unless the possible hybernation in states other than the imago is disproved. There is one other form of evidence possible. Has *atalanta* been seen or recorded in mid-Channel at all frequently? I have seen on the Riviera, on two consecutive days, huge flights of *cardui* come up from the sea—so many, indeed, that they passed for perhaps a quarter of an hour; but I do not know whether anything of the kind has been observed with *atalanta*.—J. C. Warburg.

Second Brood of Cerura furcula.—On June 22nd I found four small larvæ of this species, of which two duly pupated. I put the pupæ in a cage with others due to emerge next year. On July 29th I casually looked at the cage, when I found that the imago had emerged from each of the above-mentioned pupæ. One had evidently been out several days, as it had knocked itself about, so that it had become useless as a specimen; the other was in better condition. I see that Barrett gives one instance of this species having a second emergence in this country. In the present abnormally hot summer it seems probable that several species, ordinarily single-brooded, may produce a second brood, and I think lepidopterists should place on record instances which come to their notice.—C. G. Nurse (Lt.-Col.); Timworth Hall, Bury St. Edmunds, July 30th, 1911.

Note on Agrion armatum, Charp.—Perhaps a note supplementary to Mr. W. J. Lucas's remarks on *Agrion armatum* in the current number of the 'Entomologist' may not be out of place. When Mr. Lucas writes, "The specimen was of as bright a blue as that of *Agrion puella*," &c., it must not of course be understood that the entire body was blue. The pale marks, as shown in the plate, on the frontal and posterior segment only were of the bright blue colour, and the same remark applies to the brilliant green of the prevailing form in the Broads. From my experience the blue-marked form is rare in the Norfolk Broads, for I only captured one, and I do not think I saw another among the large number I saw on May 28th last year, nor among the fewer specimens seen on the several previous days. On the other hand, descriptions of the species seem to denote the blue-marked as the prevailing form on the Continent. I don't know from where Mr. Lucas got the notion that I took "about a dozen on May 28th," for on that day I took a considerably larger number than that, but not nearly so many as I saw!—Geo. T. Porritt; Elm Lea, Dalton, Huddersfield, August 5th, 1911.

Geographical Distribution of Macaria liturata var. nigrofulvata.—As the season has come round again for larvæ of *M. liturata*, it would be interesting if collectors could add to the localities for this interesting and well-defined variety, as well as publish their results in the 'Entomologist' when the moths emerge next June. September is perhaps the best month for the larvæ, but many are to be had in the first half of October. I have never beaten the caterpillar from larch, as the branches are out of reach, but they readily fall into the beating-tray, or inverted umbrella, when the lower branches of Scotch fir are tapped. The caterpillar is green, striped with white-yellow, and can readily be distinguished by its reddish head. There is also a grey form with purplish, black-brown head. At present the variety *nigrofulvata* would seem to have been observed only in Shropshire, Cheshire, and North Lancashire.—J. ARKLE; 25, King Street, Chester.

THE SCENTS OF BUTTERFLIES.—A discourse upon this very interesting subject was delivered by Dr. Dixey, at the Royal Institution, on March 3rd last. It is fully reported in 'Nature' for August 3rd, pp. 164–168.

PUBLIC EXHIBITION OF BUTTERFLIES.—The collection of butterflies, from all parts of the world (about 18,000 specimens), formed by Mr. Walter Dannatt, F.Z.S., will be open to the public during three weeks, dating from August 28th, at 400, Oxford Street.

REFERRING to Mr. Claude Morley's note under the heading "By the Way" in the August number of the 'Entomologist,' I think the Germans have improved on the notice prohibiting sugaring on the trees in the New Forest, as in the little valley at the head of the Konigser they have put up a board to the effect that anyone convicted of catching *Parnassius apollo* or taking away its larvæ is liable to a fine of 150 marks or three months' imprisonment.—H. H. S.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 8th.*—Dr. T. A. Chapman, F.Z.S., in the chair.—Mr. H. W. Andrews exhibited many species of the dipterous family Syrphidæ, most of them being from Kent.—Capt. P. A. Cardew, an example of *Anarta cordigera* from Rannoch, in which the hind margin and base of the fore wings were of an unusually pale grey.—Mr. S. Blenkarn, more than one hundred and fifty species of Coleoptera taken in the Isle of Wight from April 23rd to May 10th, mostly Geodephaga. Among them were *Tachyusa umbratica* and *Galerucella calmariensis*, new to the district.—Mr. Gadge, a box of Lepidoptera set so that the pin did not show through the thorax.—Mr. Edwards, a box of the species comprising the genus *Charaxes*, and a larva of *Diloba cæruleocephala* feeding on laurel.—Dr. Chapman, living larvæ of *Callophrys avis* from the South of France.

July 15th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Percy Harris, of Streatham Hill, was elected a member.—Mr. Tonge, ova of *Manduca atropos*, dissected from a captured female by the Rev. C. R. N. Burrows. They were infertile, but an ovum laid previously had produced a larva which he now exhibited in the third instar.—Mr. Hy. J. Turner showed some remarkably light-coloured pupæ of *Vanessa io* from Clandon.—Mr. R. Adkin, a series of *Biston* *hirtaria* that had remained for three winters in pupæ, and contributed notes.—Mr. West (Ashtead), a series of *Dianthœcia capsincola* bred from *Silene* in his own garden, and a captured headless moth of *Xylophasia hepatica.*—Mr. Blenkarn, a selection of *Abraxas grossulariata* bred from about two thousand five hundred Gateshead larvæ. Two nice asymmetrical forms were perhaps the most striking of a scarcely more than ordinary series.—Mr. Jäger, a series of twelve *Callimorpha hera* bred on June 22nd of this year, quite a month earlier than he had ever bred the species before.—Mr. W. J. Kaye, a fine aberration of *Mimas tiliæ*, with the usual transverse fascia of the fore wings reduced to a very small elongated central spot.—Hy. J. Turner, *Hon. Rep. Secretary.*

RECENT LITERATURE.

St. Albans and its Neighbourhood; an Account of the Topography, Geology, Hydrology, Climate, Flora, Fauna, and Archæology of the District, with a Guide to the Hertfordshire County Museum. By Members of the Hertfordshire Natural History Society.* Edited by John Hopkinson, F.L.S., F.G.S., F.Z.S., &c. Illustrated by Views, a Plan of the City, and a Map of the Vicinity. London: Dulau & Co. Hertford: Stephen Austin & Sons. 1911.

As indicated by the title, the scope of this volume of forty-five pages is somewhat comprehensive; in consequence of limited space, treatment of the various subjects is necessarily restricted; much valuable information is given nevertheless.

In the section dealing with Insecta, Mr. A. E. Gibbs reviews the present knowledge of insects of all Orders in the St. Albans area. So far it appears that the Coleoptera have received but little attention, and the same remark holds good as regards Hemiptera, Orthoptera, and in part Hymenoptera and Neuroptera.

Of Odonata, nineteen of the twenty-four species recorded for the county have been found in the St. Albans district, which is also credited with ten species of Trichoptera.

All but some two hundred and fifty of the eleven hundred and eighty-two species of Lepidoptera recorded for Hertfordshire occur in or around St. Albans. Rather more than half of the total number of species mentioned belong to those families of moths which are neglected, unfortunately, by the majority of lepidopterists.

In Diptera one hundred and sixteen species "occur within the five-mile radius."

Obituary.—We have to announce, with sincere regret, that Mr. Albert Harrison, of Delamere, Grove Road, S. Woodford, passed away suddenly on August 28th last.

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* 'Transactions of the Hertfordshire Natural History Society and Field Club,' vol. xiv. part 3, June, 1911.

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A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

By H. Rowland-Brown, M.A., F.E.S.

(i) *In Charente. Angoulême.*

I use the word "unexplored" for the title of these short faunistic papers in a purely entomological sense, and meaning thereby a part of the country wholly outside the cognizance of our British, and in some cases also of French, lepidopterists.

Gradually I am collecting information both first-hand and through the kindness of many correspondents on the other side of the Channel, which may throw some light on the curious problems of butterfly distribution in France, more especially as it indicates the trend of immigration to our shores; the reasons why certain species have stopped short at the narrow dividing sea; and why others, after apparently establishing themselves here (or even indigenous species), have gradually disappeared, not only from their authentic haunts in Britain, but also in Brittany, Normandy, and the Nord generally. Unfortunately the limits of a summer holiday confine the scope of enquiry within extremely narrow compass, but this year (1911), at all events, I have managed to make a "pioneer" expedition, which may lead me and, I trust, others of my entomologically inclined friends to visit the western regions of France for systematic study of its notably rich lepidopterous fauna in those favoured spots where *petite culture* has not entirely banished the butterfly from the face of the land.

A glance at the map of 'France Géologique' (par E. Levasseur) affords a useful indication for the lepidopterist who by experience has learnt that the calcareous strata therein depicted offer the most fruitful field for exploration. Between the volcanic rocks of Auvergne and the schist formation of Limousin and the Gulf of Gascony there is a large cretaceous tract, and in the neighbourhood of Angoulême there is no mistaking the agreeable fauna and flora which accompany the normal chalk-down. Probably I should have never discovered the little *El Dorado* for butterflies I am going to describe had I not read the delightful preface to M. Oberthür's 'Lépidoptèrologie Comparée,' fasc. iii., in which he draws a sunny picture of the country to the south-east of the former royal city, towards which we set our faces on the morning of June 30th—that is to say, Mr. B. C. S. Warren and I. That we had initial difficulties in discovering the way goes without saying. No one among the hotel servants appeared to have heard of Puymoyen, though that village is but a few kilometres beyond Angoulême, while the only information I could gather as to the forest of Livernant was that such a wood undoubtedly existed in the Gironde, miles away, that being the native Department of the "boots," who volunteered the information. At last, however, we got a map on which Puymoyen was marked, but not one of the otherwise excellent *cartes geographiques* made mention of the forest, and I came to the conclusion that the "boots" was right, and that my memory of M. Oberthür's description was at fault. At all events, we never reached that particular locality, though from after-information it is a fact that we were within a mile of it in the Vallée des Eaux Claires; consequently we missed what is probably the best woodland hunting-ground in South-west France, where of normal years a magnificent form of *Melitæa athalia* disports itself, and *Cœnonympha œdipus*—that illusive butterfly of the south-western marshes—is common enough.

However, we did manage to have an excellent day's collecting, and as soon as we had left Angoulême well behind us, and crossed to the long hill gradient on the opposite side to the Riberac road, guided by the none too frequent finger-posts, the sport began. This road at first slopes sharply upward, with occasional chalk-pits, detached patches of bramble, and clumps of marjoram. Hovering over the latter were many fine examples of *Lycæna arion* in all the bloom of their first beauty, with a few rather worn *Anthocera hippocrepidis*. Over the common land by the roadside *Cupido minimus* was very abundant—we had seen it actually in the hotel garden at Poitiers the day before—while *Agriades thetis* (*bellargus*), much to our disappointment, was in the last stage of a decadent first brood. We had, indeed, broken our journey to the south on its behalf, for Angoulême is recorded as a habitat of the lovely female aberration, *cœlestis* Obthr., and it looked very much as though we were destined to have arrived too late on the ground. Other "blues" to the fore were *Polyommatus icarus*, magnificent males of *Rusticus argus* L. (*ægon*), while in the dwarf oak scrub which fringed the roa *Strymon spini* was flying in quantities and in the finest condition, but varying only in size—a curious little dwarf male I boxed measuring no more than the typical *C. minimus*. *S. ilici* occurred also singly, while the brown "skippers," *Adopæ* *lineola* and *Augiades sylvanus*, were well to the fore. At this early date the apparition of *Satyrus circe* and *S. hermione*—the former in the ascendant—was something of a surprise; nor can I find from my field-notes that in all our subsequent wanderings we encountered this magnificent Satyrid again. But by this time it was noon, and still we had not arrived at the village of Puymoyen, from which we presently passed to the chalk hills sloping gently towards the lovely valley, well designated Eaux Claires, for it was there at the coldest of streams, bubbling out from a fern-wreathed "source," that we quenched our thirst and took our *déjeuner*. Hard by we had feasted our eyes on the last of the spring *Gonepteryx cleopatra*, and boxed a few richly coloured females of *Melitæa didyma*; occasional *Everes* (*argiades*) *amyntas* further kept our nets busy, and here also, though we took several of the desired *cælestis*, they were in such forlorn condition that we gladly gave them their liberty. I may say too that, although we were of course too early for it, *Lycæna euphemus* is a speciality of this valley, while, had we but known it, on the other side, across the scented hay-fields where the peasants were carting their first rich crops, but a low line of hills divided us from the much-discussed forest of Livernant. We devoted the rest of the afternoon, however, to questing for *cælestis* unsuccessfully on the chalk-downs on the Puymoyen side, finding a pretty light form of *Pararge egeria* in the little brook-side copses, and the long green grasses hung with *Thymelicus actæon*. Hereabout also I captured a perfect *Pieris manni*, chiefly interesting to me as the first from Western France which had fallen to my share. It is, however, common enough in these regions, and up to the north as far as Angers, where M. Delahaye reports and describes it in an interesting monograph on the variation of the species in his Department, Maine-et-Loire.*

For a single day's experience the following list of species observed and taken is decidedly encouraging. I have also included, in brackets, the one or two further species met with by M. Charles Oberthür, and M. Dupuy, of Angoulême, at this particular spot:—

Adopæa lineola, *Augiades sylvanus*, *Thymelicus actæon*; *Hesperia carthami* (one very worn example); *Callophrys rubi* (one); *Strymon spini*, *S. ilicis*;† *Everes argiades* (*amyntas*); *Cupido minimus*; *Rusticus argus*, L. (= *ægon*, Schiff.); *Agriades thetis* (and ab. ♀ *cælestis*), [*A. corydon* ab. *syngrapha*]; *Polyommatus icarus*; *Lycæna arion*, [*L. euphemus*]; *Aporia cratægi*, *Pieris manni*; *Colias edusa*, *C. hyale*; *Gonepteryx cleopatra*, *Argynnis aglaia*; *Brenthis dia*, *B. euphrosyne* (one); *Melitæa*

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* 'La Pieris Manni en Maine-et-Loire. Principaux Caractères de la Race angevine.' D. Delahaye. Angers, J. Siraudeau. Dec. 1910.

† M. Dupuy informs me (*in litt.*) that *Chrysophanus alciphron* var. *gordius* comes as far north on this side of France as Angoulême.

didyma, [*M. athalia*]; *Pyrameis cardui*, *P. atalanta*; *Vanessa io*; *Eugonia polychloros* (one fresh example in the town of Angoulême); *Pararge mæra*, *P. egeria*; *Satyrus circe*, *S. hermione*; *Hipparchia semele*; *Epinephele jurtina*; *Aphantopus hyperanthus*; *Cænonympha arcania*, *C. pamphilus*, [*C. œdipus*]; *Melanargia galatea*.

(To be continued.)

NOTES ON THE VARIETIES OF *PERONEA CRISTANA*, FAB., LATELY IN THE COLLECTION OF THE LATE J. A. CLARK; WITH A REVISION OF THE NOMENCLATURE.

By Sydney Webb.

(Continued from p. 292.)

Striana Group.

Dark buttoned, excepting in *insulana*; pale striæ take the place of vitta.

The only new name, introduced by Clark, appropriate to this group was one he adopted from Mr. Bond, who had separated and labelled as distinct a series without buttons, but not otherwise distinguishable from *striana* of Haworth, calling it *prostriana*. This characteristic is sufficient to distinguish any specimen without further description.

Insulana, Curt., Desv.—Comes very near to *striana*, Haw., but it is a darker insect, with large distinct pale cream button, the bone-coloured striations run to the hind margin, and they almost constitute a distinct vitta. Superficially it thus resembles *subvittana*, Steph.

Striana, of Haworth, was doubtless named from the vitta being broken up into ashy coloured lines, which are generally three in number. The first along the inner margin, another from the base following the line of the fold, and a third immediately above the second, which does not begin until the first of the minute tufts before the button. The space between the first and second is more or less filled in with ashy grey, and the chief differences between moths of the *striana* form occur here, as occasionally from two to five subsidiary diverging lines, starting from the third line and below the button, spread fan-like outwards to the end of the wing; but it is not desirable to name any of these.

Desvigne's plan of placing forms of *cristana* in separate groups, although far from satisfactory, is preferable to Doubleday's attempt at a natural sequence. I have followed the former plan, but no effort has been made to place the groups *seriatim*;

those desirous of doing so will, therefore, have to re-arrange the described forms to fit in with their own ideas.

If, for example, one wishes to arrange the aberrations from *striana* as a starting-point, they would follow in sequence thus:—*prostriana*, *striana*, *semistriana*, *substriana*, *brunnea*, *brunneana*, *spadiceana*, *insulana*, *consimilana*, *sericana*, *merlana*, *ulotana*, *desfontainana*, *transversana*, and this would bring us up to *cristana* (vere), omitting the side branch, to *chantana*, &c.

Where description has been necessary, I have kept as closely as possible to Stainton's colour terms, all of which are well known to us. The bracketed portions need no comment, for the names are only given to make the tale of *cristana* varieties complete.

As to the other varieties mentioned in Doubleday's list, but not particularly referred to already:—

Lichenana, Curt., may perhaps be identical with *subvittana*, Steph.

Unicolorana, Desv.—The ground colour of this is mentioned as dark green, which surely cannot refer to any form of *cristana*. The unicolorous pale brown variety, so well known, was placed in all our older collections under this name, and it had better be retained for such forms.

Ruficristana, Johns., was, as we have said, very properly dropped, for its only mark of distinction was the little red spot at the base of the wing. This is frequently present in many of the *cristana* aberrations, notably so in *cristana* (vere), *merlana*, *striana*, *brunnea*, *semiustana*, *subfulvovittana*, and *cristalana*.

Of the foreign aberrations mentioned in Clark's list, *rossiana*, Fab., dates back to 1794, and may have been a stunted specimen of *cristana*, whilst the other—*albicostana*, Sand—is evidently one of the *curtisana* group, unknown to us as British. These should be expunged from our catalogues.

On the other hand, a look-out should be kept for other specimens of the following, which are at present represented in my collection by single examples:—

1. An insect, like a large *desfontainana*, with pale mottlings at the ends of the wings; no rufous line above the central orange dash, a whitish costal half fascia ending at the button, and vitta entirely wanting.

2. A modification of *desfontainana*, with *subvittana* basal blotch.

VIVIPARITY IN LEPIDOPTERA.

By F. N. Pierce, F.E.S.

Some two years ago, whilst staying with the Rev. C. R. N. Burrows, we paid some little attention to the wax pouch of female *Parnassius apollo*, and in the course of making one of the preparations, I found a perfectly formed larva in the female body. I at once announced the fact to him that *P. apollo* brought forth its young alive; but after discussing the matter, we both came to the conclusion that the fertilized ovum had just missed being laid before the mother had been killed, and the egg had subsequently hatched. This larva was exhibited at a meeting of the City of London Entomological Society, without any doubt being expressed against its being the larva of the species under examination.

The other day I mounted a pair of *Colias edusa*, when I again observed a fully developed larva in the oviductus communis curled round, the head and tail touching, thus forming a ring. I communicated this to Mr. Burrows, and on my arrival at his house a few days ago, we examined the remaining three specimens of female *P. apollo*, one of which contained a fully developed larva, the other two, only eggs. Mr. Burrows then turned to a pamphlet sent him by Mr. L. B. Prout, a reprint of Mr. N. J. Kusnezou's article in Russian on "The probable Viviparity in some Danaid, *i. e.* Pierid, Butterflies," in which he tabulates his similar experiences, and mentions several species of the genus *Colias* and others having the gift of viviparity. As he does not mention *Parnassius apollo*, I think it is as well to put on record the fact that this species also belongs to this viviparous group.

1, The Elms, Dingle, Liverpool: August 31st, 1911.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. Distant.

Fam. LYGÆIDÆ.

Lethæus notabilis, sp. n.

Head black, opaque, ocelli red; antennæ sordidly stramineous, bases of third and fourth joints piceous; pronotum and scutellum shining dark castaneous or black, anterior margin, extreme lateral margins, and lateral angles of the former pale ochraceous; clavus and corium pale shining ochraceous; two spots on inner claval margin, one near base the other beyond middle, corium with a spot on basal area, an irregular transverse black fascia near inner angle, enclosing a small ochraceous spot, and the apical angle shining black; membrane subhyaline with the veins brownish; body beneath castaneous; rostrum and legs pale ochraceous; head including eyes a little more than half the width of pronotum at base; ocelli nearly touching the eyes; antennæ with the basal joint slightly shorter than head, second joint much longer but not quite twice as long as first, third and fourth subequal in length, each slightly shorter than second; pronotum somewhat thickly finely punctate, transversely constricted before the middle, the posterior angles rounded and slightly nodulose, the lateral margins nearly straight and moderately oblique; scutellum a little longer than broad at base, finely punctate, distinctly longitudinally ridged near each lateral margin; clavus with several longitudinal series of punctures; corium somewhat sparsely punctate, the punctures mostly in longitudinal series; membrane with four veins connected at the basal cell; rostrum reaching the posterior coxæ; sternum distinctly punctate; posterior tibiæ distinctly finely spinulose, posterior tarsi with the first joint longer than the two remaining joints together. Long. 4½ millim.

Hab. Ceylon; Sigirya (E. E. Green).

Allied to *L. crassiceps*, Dohrn.

Fam. CAPSIDÆ.

Ernestinus, gen. nov.

Head broader than long; eyes almost touching the anterior margin of the pronotum, each extending slightly beyond the anterior pronotal angles; antennæ inserted in front of eyes, basal joint longly extending in front of head, its apical area moderately thickened, second joint moderately thickened, about or almost twice as long as first; pronotum about as long as breadth at base, excluding the anterior area convexly rounded and there thickly punctate, anterior area distinctly foveolate near middle, posterior margin truncate, not covering base of scutellum; scutellum small, triangular, somewhat transversely impressed at basal margin; corium about twice as long as broad, lateral margins nearly parallel, very slightly rounded; cuneus narrow, longer than broad; membrane considerably passing abdominal apex, with a large somewhat subquadrate basal cell; legs moderately slender, not spinulose.

Closely allied to the Neotropical genus *Pseudobryocoris*, Dist., but differing in the truncate posterior margin of the pronotum, the scutellum being thus quite uncovered.

Ernestinus mimicus, sp. n.

Head, pronotum and scutellum black; antennæ with the first and second joints black, basal area of the first and the remaining joints very pale stramineous; corium shining whitish hyaline, a transverse fascia inwardly widened a little beyond middle of corium, and the clavus, black; cuneus greyish white; membrane greyish white, the basal cellular areas shining fuliginous; body beneath shining black; rostrum, coxæ and legs pale stramineous; rostrum reaching the posterior coxæ; pronotum, excluding anterior area, very thickly punctate; other characters as in generic diagnosis. Long. 3½ millim.

Hab. Ceylon; Haragama (E. Ernest Green). "On aroid plant, banks of river."

This species in general appearance, coloration and markings almost absolutely resembles *Pseudobryocoris bicolor*, Dist., from Panama (*cf.* Biol. Centr.-Amer. Rhynch. i. p. 286, tab. xxviii. fig. 3), the structure of the posterior margin of the pronotum and the colour of the anterior collar to pronotum alone separating it. It cannot, however, be regarded as a case of mimicry, the habitats of the two species being too wide apart to afford any *raison d'être* for the theory.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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(Continued from p. 262.)

Kolbe's Classification (1908).

I. Suborder **Adephaga**, with one family-group.

Families: Carabidæ, Paussidæ, Rhysodidæ, Amphizoidæ, Hygrobiidæ, Haliplidæ, Dytiscidæ, Gyrinidæ.

To the characters of this suborder Kolbe adds the following: Prothorax with shield-like notum and distinct lateral margin, pleuræ very distinctly separated from the notum and from the sternum, and the epimeron separated by a distinct suture from the episternum.

II. Suborder **Heterophaga** (= **Polyphaga**).

Division A. Haplogastra.

Family-group: Staphylinoidea. Families: Those recognized by Ganglbauer somewhat differently arranged, with the addition of Anisotomidæ and ? Ectrephidæ.

Family-group: Actinorhabda. Families: Synteliidæ, Passalidæ, Scarabæidæ.

Division B. Symphyogastra.

AA. Subdivision Archostemata, with one family-group.

Family: Cupedidæ.

BB. Subdivision Synactostemata.

A. Heterorrhabda.

Pelmatophila.

Family-group: Malacodermata. Families: Drilidæ, Lampyridæ, Lycidæ, Cantharidæ (= Telephoridæ).

Family-group: Trichodermata. Families: Malachiidæ, Melyridæ, Corynetidæ, Derodontidæ, Cleridæ.

Family-group: Palpicornia. Family: Hydrophilidæ.

Family-group: Dascylloidea. Families: Psephenidæ, Helodidæ, Ptilodactylidæ, Eubriidæ, Eucinetidæ, Dascillidæ, Artematopidæ, Lichadidæ, Rhipidoceridæ, Chelonariidæ, Byrrhidæ, Nosodendridæ, Dermestidæ, Heteroceridæ, Dryopidæ, Helmidæ, Georyssidæ, Cyathoceridæ.

Family-group: Sternoxia. Families: Cerophytidæ, Cebrionidæ, Plastoceridæ, Dicronychidæ, Elateridæ, Eucnemidæ, Throscidæ, Buprestidæ.

BOSTRICHOIDEA.

One family-group. Families: Lymexylonidæ—Sphindidæ, Aspidophoridæ, Cioidæ—Ptinidæ—Lyctidæ, Psoidæ, Anobiidæ—Bostrychidæ.

HETEROMERA.

One family-group. Families: Melandryidæ, Mordellidæ, Rhipidophoridæ, Cephaloidæ, Œdemeridæ, Pythidæ, Anthicidæ, Pedilidæ, Xylophilidæ, Pyrochroidæ, Meloidæ, Salpingidæ, Petriidæ, Monommidæ, Nilionidæ, Trictenotomidæ, Othniidæ, Lagriidæ, Cistelidæ, Tenebrionidæ, Ægialitidæ, Tentyriidæ.

B. ANCHISTOPODA.

Family-group: Clavicornia. Families: Cucujidæ, Monotomidæ, Nitidulidæ, Byturidæ, Ostomidæ (= Trogositidæ)—Cryptophagidæ, Atomariidæ, Mycetophagidæ, Phalacridæ, Catopochrotidæ, Erotylidæ—Lathridiidæ, Thorictidæ, Gnostidæ, Adimeridæ, Colydiidæ, Endomychidæ, ? Pseudocorylophidæ, Coccinellidæ.

Family-group: Phytophaga. Families: Prionidæ, Cerambycidæ, Chrysomelidæ, Bruchidæ.

Family-group: Rhynchophora. Families: Rhinomaceridæ, Anthribidæ—Platypodidæ, Scolytidæ—? Proterrhinidæ, ? Aglycyderidæ—Brenthidæ, Oxycorynidæ, Rhynchitidæ, Apionidæ, Brachyceridæ, Curculionidæ.

As distinguishing characters of the suborder Heterophaga, Kolbe gives the following amongst others:—Prothorax with shield-like notum, and either with distinct lateral edge or the pleuræ more or less fused with the notum, and in extreme cases (Rhynchophora) fused also with the sternum, the sides then rounded; the episterna and epimera almost always fused (exception, Passandrini).

With regard to these, it seems to me that Kolbe has missed the one essential character of the prothorax that serves to distinguish the Adephaga from the Polyphaga (= Heterophaga). This is, as I have already pointed out, the presence in the Adephaga of a more or less distinct suture between the pleuræ and the notum, and the absence in the Polyphaga of any such suture. In the Adephaga there is generally a suture between the episternum and epimeron of the prothorax, but it is wanting in some of the families. It is never, I believe, really present in the Polyphaga. In the Passandrini, mentioned by Kolbe as an exception, there is to be seen an impressed line in a similar position, but this line can hardly be, and certainly does not appear to me to be, a true suture. It is more likely to be a secondarily acquired character, having no such significance as that which Kolbe assigns to it, namely, that it is in the Passandrini, as in the Adephaga, a primitive character in which both resemble the Urcoleopteron.

The most noteworthy points in which Kolbe's classification differs from that of Ganglbauer are: (1) the inclusion of the Cupedidæ as a group in the suborder Polyphaga; (2) the division of the Polyphaga into the Haplogastra and Symphyogastra (distinguished chiefly by the separation in the one, and the fusion in the other, of the sternites and pleuræ of the second and third abdominal segments), and the inclusion of the Synteliidæ and Lamellicornia in the division Haplogastra; (3) the recognition, as separate family-groups of the Malacodermata, Trichodermata, Dascylloidea, Sternoxia, Bostrychoidea, and Clavicornia; (4) the placing of the Clavicornia in the same subdivision as the Phytophaga and Rhynchophora, with the Heteromera coming between the Clavicornia and the other groups which Ganglbauer included with them in his single family-series Diversicornia.

We have already discussed Kolbe's reasons for adopting the course indicated by points 1 and 2. The splitting up of the Diversicornia into a number of separate groups is, no doubt, desirable, and would be a great convenience if it could be attained with any great success. Kolbe and Lameere have both attempted it, but not with the same results; and I am inclined to think that, in the present state of our knowledge, Ganglbauer was wise to wait before going any further in that direction.

(To be continued.)

NEW SPECIES OF BOARMIINÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 297.)

Alcis tripartaria, sp. n.

♀. Fore wings whitish, basal and outer thirds suffused with greyish and clouded with tawny; a short black subbasal line, and a black mark below it on dorsum; antemedial line black, indented below middle; postmedial line black, angled below costa and again above dorsum; a black shade-like, irregular line before the postmedial, angled and expanding on costal area; subterminal line of the ground colour inwardly edged and shaded with black; a large black spot extending from postmedial line to subterminal line, placed just under upper angle of the former; two black spots in a blackish cloud on termen below apex; fringes greyish, chequered with blackish, an interrupted black line at their base. Hind wings whitish, freckled with grey; discal mark and postmedial line black, the latter slightly angled below costa and above dorsum; dusky shade-like subterminal band; fringes greyish, interrupted line at their base black. Under side whitish, freckled with greyish, discal spot black; transverse lines as above, but less distinct; black edging of subterminal line broader; hind wings as above.

Expanse, 34 mm.

Collection number, 794.

Two female specimens from Arizan (7500 ft.); one taken September 15th, 1906, the other in August, 1908.

Alcis fucataria, sp. n.

♂. Fore wings white, freckled and suffused with greyish brown on basal and costal areas; antemedial line blackish, only distinct on costa and towards dorsum, enclosing a pinkish brown basal cloud; postmedial line black, undulated; discal mark black, a dusky line above it to costa and below it to dorsum; subterminal line whitish, wavy, inwardly shaded with blackish except towards costa; the area beyond postmedial line greyish brown, tinged with pinkish. Hind wings white, slightly freckled with greyish brown; antemedial line greyish brown, almost straight, not extending to costa; postmedial line black, tapered and faint towards costa; subterminal line whitish, inwardly shaded from dorsum to just above middle with blackish, the area beyond greyish brown, enclosing a pinkish brown cloud above tornus. Under side pale ochreous brown; fore wings freckled with dark grey on costal area, and suffused with dark grey on apical portion of outer area; postmedial line as above, but dark grey, and not so distinct, followed by a dark grey line almost parallel with termen, and marked with black on the veins; discal mark blackish, curved; hind wings with a dark grey, curved, postmedial line; traces of dusky antemedial and subterminal lines; discal dot black, minute.

♀. Similar to the male, but all the wings more completely freckled with greyish brown; on the under side the lines are indistinct, and the dark grey suffusion of outer area extends almost to dorsum.

Expanse, ♂ 44 millim., ♀ 42 millim.

Collection number, 796.

One example of each sex from Arizan (7500 ft.), September, 1906.

This species comes near *A. tendinosaria*, Brem.

Alcis undularia, sp. n.

♀. Fore wings white, slightly freckled with brownish on medial third; basal and outer thirds greyish brown, freckled and clouded with blackish; antemedial line indistinct; medial line brown, black and expanded on costa, projected inwards above middle; postmedial line black, undulated, terminating just beyond middle of dorsum, which is tinged with ochreous brown; the veins beyond postmedial line marked with black; subterminal line white, wavy, shaded inwardly with blackish; a whitish patch beyond subterminal between veins three and four, and opposite this a greyish brown streak extends to antemedial line. Hind wings white freckled with brownish; antemedial line greyish brown, broad, and nearly straight; postmedial line greyish brown, curved towards dorsum, tapered towards, but not extending to, costa; subterminal line white, shaded with greyish brown, deeply angled outwards about middle. Fringes greyish brown, paler between the veins, except towards apex of fore wings, preceded by black wavy line. Under side white, costal area of all the wings tinged with ochreous; fore wings flecked with brown on costa and clouded with blackish on basal third; outer third black, enclosing a white spot about middle; transverse lines as above, but faint, as also are those of the hind wings; all the wings have the black discal mark most conspicuous on under side.

Expanse, 49 millim.

Collection number, 793.

One female specimen from Arizan (7500 ft.), September, 1906. Allied to *A. trikotaria*, Feld.

Alcis argillacearia, sp. n.

♂. Fore wings pale ochreous brown, central area limited by the transverse lines, paler, almost white; basal and outer areas mottled with blackish; antemedial line black, slender, nearly straight; discal mark linear, black, placed on the inner edge of a black mottled brown cloud; postmedial line black, incurved below costa, black points on its outer edge; subterminal line whitish, wavy, indistinct. Hind wings pale ochreous brown, whiter towards base, freckled with darker; the only distinct markings are a brownish discal dot, a brownish postmedial line not extending to costa, and some brown clouds on outer area. Under side similar to above, but fainter.

Expanse, 46 millim.

Collection number, 1570.

A male specimen from Arizan (7300 ft.), August, 1908.

BY THE WAY.

The season is over! And how remarkable a one has the present season been—the brilliancy of May giving way to a short cool snap in June when "things" should have been abroad in their greatest numbers, and then the incessant heat thence till a week or so ago! At first the high temperature was most beneficial for collecting, but towards the end of July herbage began to flag in the continued drought, and in August the New Forest was badly burnt up by the sun, which was no less felt on the coast than inland; far fewer insects were to be met with at Southwold in September than in the cold and rainy corresponding period of last year.

From a popular point of view, wasps have been the most remarkable feature of the season, and we have all played 'Punch's' New Garden Game, "Slicing the Wasp." Many deaths from their stings are reported from Bedford, Erdington, Norfolk, &c., none directly fatal, unless inflicted in the mouth; while a horse worth thirty pounds died from a sting—presumably one only—at Market Bosworth. No cause but the hot, dry spring is known to account for the prevalency of the pest; in our garden were five nests, in a single Suffolk churchyard were thirteen, and twenty-one were destroyed at Aldeburgh in three days. The Southgate Urban Council appointed an Official Wasp-catcher, who thought twenty-seven nests a fortnight towards the end of August good work. The rarer Vespæ have also been in evidence, and *V. norvegica* is reported from Beccles.

The fourth of the Local Government Board's Reports on flies as carriers of infection contains much matter of interest to "practical" entomologists, those interested in species directly affecting the lord of creation. How long flies of sorts remain infectious after receiving the microbes, how the eggs of parasitic worms are transmitted to and from them, and the distance to which disease may be conveyed within a given period, are dealt with. Clark and Alexner also consider, in the Journ. Amer. Med. Assoc., June, 1911, the contamination of flies with the virus of epidemic poliomyelitis. The *précis* in the Brit. Medical Journal of August 19th is capital.

The Memorial of influential Naturalists, recently presented to the Premier, has done its work. We read in the 'Morning Post' of September 5th:—"A compromise in a long-standing dispute as to the Government Museum sites in South Kensington and their future development has been arrived at. . . . The settlement now reached provides for the grounds of the Natural History Museum remaining intact, while the Science Museum will be erected on the land to the north of the boundary fixed in 1899. 'It is only a triumph of patient perseverance, backed up by facts and influential support.'" The 'Times' of the 4th considers the arrangement "one which is satisfactory to the Trustees of the British Museum, inasmuch as by the terms of the settlement the Natural History Museum retains all the land allotted to it in 1899, and the boundary then agreed upon is not to be disturbed," so the very necessary expansion is allowed ample space.

Verrall is dead! UNHELM. C. M.

NOTES AND OBSERVATIONS.

The Natural History Museum, South Kensington. — Some months back an article appeared in this Magazine, dealing with the alleged intentions of the Government to appropriate the extensive site of the "Natural History Museum" to the uses of a projected new "Science Museum." The matter, we are glad to say, has now been settled agreeably to the interests of all parties; the Natural History Museum retains its only possible area for expansion; the Science Museum is relegated behind the northern limit of the Museum enclosure. We owe our best thanks, therefore, to the energetic naturalists who promoted the petition to the authorities for a re-hearing of the case. Their efforts have been entirely successful; and all that remains for the Government to do is to sanction the much needed additions to the building in which, at present, the Entomological Department is "cribbed, cabined, and confined."—H. R.-B.

Mr. Eustace R. Bankes, having been ordered complete rest by his doctors, in consequence of a severe nervous breakdown, hopes that his correspondents will kindly refrain from writing to him, or sending him insects for identification, &c.

The Nature of Melanism.—Mr. Leigh (*antea*, p. 163), speaking of the dark colour of some species of moths, says: "While in others it may be of physiological importance, and associated in some way with constitutional hardiness." This reminded me of an incident I once witnessed, which seems to bear on this point. In the spring of, I think, 1897, being anxious to get ova of *Chimabacche fagella*, I brought home one female and two males. One of them was of the pale grey form, and the other was a very dark specimen. I placed them in a cage together with the female, and later, towards dusk, I looked into the cage. The grey male was just in the act of pairing with the female, but before he had finally clasped her the dark male ran up the back of the cage, brushed the grey one aside, and paired with the female. The grey male did not show any fight at all. There may, of course, have been some preliminary skirmishing, but all I saw was the finish of the fight, if there had been one. During the short time that this action was taking place the female appeared perfectly indifferent to what was happening. If it could be shown that when a dark and a light male form contend for a female the dark form is usually victorious, another factor would be added to our knowledge of the production of melanic and melanochroic forms.—Alfred Sich; Corney House, Chiswick, Middlesex, Sept. 5th, 1911.

Cateremna terebrella, Zk. — I was pleased to read in last month's 'Entomologist' of the occurrence of this, at present, little-known "knothorn" in Devonshire. I bred and duly recorded (Ent. Mo. Mag. xlii. 180) a specimen from a spruce-fir cone picked up in Surrey when collecting a few cones for the purpose of breeding *Cydia strobilella*. This emerged on July 3rd; another appeared July 30th, and a third August 1st. After an interval of a month, finding that no more came out, and wishing to see a pupa-case, I opened the few cones I possessed, duly found the empty pupæ, and somewhat to my surprise, in almost the last cone, a larva apparently about half-grown; this was, of course, placed back in the flower-pot, and eventually came out a fine female on June 14th in the following year (1907). Four specimens altogether were thus bred from the few cones picked up in the spring of 1906. I have searched most assiduously each year, but, strangely enough, have never found one since! From the fact that there is no outward visible sign of the larva within, unlike the other two cone-feeding "knothorns," *Dioryctria splendidella* and *D. abietella*, F., I expect the insect is very much overlooked. From this note it will be seen that it is inadvisable to throw the cones away without a careful examination. — A. THURNALL; Wanstead, Essex, September 9th, 1911.

NOTE ON LARVA OF AGROTIS RIPÆ.—On the sandhills about Palling, East Norfolk, this year were swarms of *A. ripæ* feeding on the sea-bindweed. While collecting a number of them I found, to my surprise, that they were several times able to bite my hand sufficiently hard to cause sharp pain. In every case they bit between the fingers, presumably in an attempt to burrow through and escape. I have never noticed this characteristic in any other larva, but it may be for want of observation.—CHARLES MELLOWS; Bootham School.

HYBERNATION OF P. ATALANTA.—In view of recent notes on the above subject, it may be of interest to note that on June 9th, 1910, I took a perfect specimen of this butterfly in the house here.—E. F. STUDD; Oxton, Exeter, September 12th, 1911.

EARLY APPEARANCE OF EREBIA EPIPHRON var. CASSIOPE AND PARASEMIA PLANTAGINIS IN WESTMORLAND.—On June 7th this year I took eighteen specimens of *E. epiphron* var. *cassiope*, and saw about as many more, on a mountain not far from Helvellyn. They were flying at an elevation of about two thousand feet. They were all males, the females apparently not having emerged. I have usually taken this insect, in the same locality, in fresh condition from June 22nd to the end of the first week in July, according to the seasons. Along with *cassiope*, I took a few and observed many more *P. plantaginis* males, and also one var. *hospita*. At this elevation the species and its variety are usually fresh out in the first week in July in this particular locality. — B. H. CRABTREE; Cringle Lodge, Levenshulme, Manchester.

EARLY DATE FOR CŒNONYMPHA TYPHON (DAVUS).—On the mosses near Hoverthwaite (Lanc.), I obtained *Cœnonympha davus* var. *rothlebii* on June 5th, although in 1896 I took this insect as early as May 30th, but the latter date was very exceptional, and I should think almost constitutes a record. This year *davus* was out fully a fortnight earlier than in normal seasons.—B. H. CRABTREE.

BLACK ABERRATION OF DASYCHIRA PUDIBUNDA.—I took a beautiful black male specimen of *Dasychira pudibunda* in my moth-trap on June 9th last year, and a friend of mine, who resides about a mile from here, had one in his moth-trap this year. I had never seen or heard of this variety before.—(Major) R. B. ROBERTSON; Fairlawn, Chandler's Ford, September 8th, 1911.

Tortrix pronubana.—Having read and digested Mr. Adkin's remarks on this moth, I determined to try my luck at such seaside places as I could get at. *Tortrix* larvæ at Bournemouth in May were as the sands in number, but none of those I took were of the desired kind. Being at Weymouth in August, I tried again, and, returning home with my spoils, I found emerged yesterday afternoon a small but unmistakable female *pronubana*.—(Rev.) W. Claxton; Navestock Vicarage, Romford, September 10th, 1911.

Lycæna icarus ab.—On August 13th, in the same field referred to in my record of *C. phlæas* ab. *alba*, I took an aberration of *Lycæna icarus*, in which the spots on the under side of the hind wings are almost obsolete, the basal series being represented by two minute dots, and the submedian by one spot (the sixth).—Harold B. Williams; 82, Filey Avenue, Stoke Newington, N., Sept. 5th, 1911.

Chrysophanus phlæas ab. alba, Tutt, in Bucks.—I captured a perfect male specimen of *C. phlæas* ab. *alba* in a chalky field near Little Missenden, Bucks, on Aug. 12th last.—Harold B. Williams.

Chrysophanus phlæas var. schmidtii in Lancs.—I should like to record that on July 31st, 1911, I took a specimen of *Chrysophanus phlæas* var. *schmidtii*, in very fair condition, in Church Road, St. Anne's. I believe this is the first one captured in this place, although one was seen before in 1908. Also on July 6th I took an almost black *Satyrus semele* (male); is this a named variety?—J. W. Muirhead; 31, Fairhaven Road, St. Anne's-on-the-Sea, September 7th, 1911.

Chrysophanus phlæas var. eleus at Colchester.—On Friday, August 25th, worn specimens of *C. phlæas* were common on *Inula* flowers, and a single specimen of a new brood heralded the coming of the next generation. Among the worn ones was an insect which I could not make out, until I saw too late that it was a very dark male *C. phlæas* var. *eleus*, for it vanished the moment I realized what it was. Its dark appearance may have been due to its being somewhat worn perhaps. In any case, I tried to solace myself with that conclusion, after watching for some time in the vain hope of its return.—W. H. Harwood; 94, Station Road, Colchester.

Varieties of Chrysophanus phlæas and Dianthœcia conspersa.—On September 9th, 1911, I saw a small "copper" with hind wings quite black, no trace of copper being visible. It was settled on a flower, and, being without a net, I was fortunate in securing it by enclosing it between the top and bottom of an open pill-box. During the summer I bred a *D. conspersa* in which the usual pale markings were almost black.—A. J. Spiller; Godolphin Cross, Helston.

Papilio machaon at Colchester.—Two fine larvæ of *P. machaon* were found feeding on carrot-leaves in an allotment here, and the following week another was brought me which had been discovered feeding on *Dictamnus fraxinella-alba* in one of Mr. R. W. Wallace's flower-fields near my house. This has since produced a fine light-coloured female. Two other specimens were seen on the wing in other parts of the town. The ova from which these originated must have been laid by a female which had wandered from its native haunts, or by a specimen which escaped or was liberated after pairing. In any case, these occurrences seem worth recording.—W. H. HARWOOD; 94, Station Road, Colchester, September 8th, 1911.

PIERIS RAPÆ AND P. NAPI TRIPLE-BROODED IN 1911.—Third broods of *Pieris rapæ* and *P. napi* abounded at the end of August, and are still common.— W. H. HARWOOD; 94, Station Road, Colchester, September 8th, 1911.

Specimens of a third brood of *P. napi* and of *P. rapæ* were to be taken in Northamptonshire in mid August, the second brood appearing as early as the hay harvest.—CHARLES MELLOWS; Bootham School.

A male specimen of *P. rapæ* emerged on August 30th, and a female on September 3rd, both from larvæ reared in the garden here. Other larvæ fed up at the same time, and duly pupated, but up to this date (September 13th) no more butterflies have appeared.—H. GARRETT; 21, Angell Road, Brixton, S.W.

I have noticed fresh specimens of *Pieris rapæ* on July 5th (female) and September 5th (male and female) at St. Anne's. Is not the latter probably a third brood?—J. W. MUIRHEAD; 31, Fairhaven Road, St. Anne's-on-the-Sea, September 5th, 1911.

VANESSA IO DOUBLE-BROODED IN 1911.—On September 6th I found a large brood of nearly full-fed *V. io* larvæ feeding on a patch of low nettles which had been mown off and were freely springing up again. So far as I know, the only other recorded second brood in Britain is that mentioned in South's 'Butterflies of the British Isles.' —W. H. HARWOOD.

THIRD BROOD (?) OF PAPILIO MACHAON.—The exceptional summer seems likely to produce three broods of *P. machaon* this year. In previous years I have always obtained half-grown larvæ of the second brood at Hickling about August 15th. This year, on the same date, I found eggs and young larvæ from females of the second generation, and these are already (September 1st) nearly full-grown.—C. MELLOWS; Bootham School.

AGROTIS EXCLAMATIONIS IN SEPTEMBER.—I obtained three perfect specimens of *A. exclamationis* at sugar on September 8th last. Is this species normally double-brooded?—J. S. CARTER; Iden, Sussex.

[*Agrotis corticea* has been occasionally noted in September, but we do not recall any record of *A. exclamationis* having been captured in this month. In 'Barrett,' however, there is a record of a casual emergence of the last-named species in October.—ED.]

HADENA PISI IN SEPTEMBER.—Eight perfect specimens of *H. pisi* came to sugar on September 15th.—L. W. NEWMAN; Bexley, Kent.

LARVA OF ARCTIA CAIA FULL-GROWN IN SEPTEMBER.—Three larvæ of *A. caia* were found on September 16th while searching for *Pyrameis* *atalanta.* Of the latter, I may mention that on September 16th I obtained imagines, larvæ in all stages, and pupæ.—L. W. NEWMAN.

CERURA FURCULA IN AUGUST.—Small larvæ of *C. furcula*, picked up at the beginning of July, attained the imago state in early August.

NOTODONTA DROMEDARIUS IN LATE JULY.—Larvæ of this species, obtained at the same time as the *C. furcula* mentioned above, produced imagines at the end of July.

HYGROCHROA (PERICALLIA) SYRINGARIA IN SEPTEMBER. — I obtained ova from a female *H. syringaria* at the end of June last. The larvæ from these were sleeved on privet, and about a score fed up rapidly, pupated, and produced exceptionally fine imagines during the second week of September. The rest of the larvæ remain small, and evidently intend to hybernate in the usual course.—L. F. BURT; Aryke, Shifnal, Salop.

[All three of the species referred to by Mr. Burt are known to be partially double-brooded in favourable years.—ED.]

ACRONYCTA ALNI AND ABRAXAS GROSSULARIATA ab. LACTICOLOR IN WARWICK.—On August 24th I took in my garden here a specimen of *Abraxas grossulariata* ab. *lacticolor.* On the following day a larva of *Acronycta alni*, taken from a hazel-bush in a garden in this town, was brought to me, and within a few hours pupated in a piece of cork.—LLOYD CHADWICK; 7, Northgate Street, Warwick.

MACARIA LITURATA var. NIGROFULVATA IN WARWICKSHIRE.—Referring to Mr. J. Arkle's note in the September number of the 'Entomologist,' I should like to record having taken within the last five years two specimens of this variety (one at sugar) in Oakley Wood, near Warwick. The record of one of these captures, already given in 'Moths of the British Isles,' was taken from the 'Proceedings' of the Birmingham Natural History Society, in which unfortunately the locality of the wood was omitted.—LLOYD CHADWICK.

PLUSIA MONETA IN BALHAM.—I captured on June 21st, 1911, a specimen of *Plusia moneta* in my garden, hovering over a plant of *Delphinium.*—E. SHARPE; 28, Balham Park Road, S.W.

COLIAS HYALE IN BUCKS.—On September 2nd I had the good fortune to capture two specimens of *Colias hyale* in a lucerne field in the Hugenden district; one was in good condition, but the other somewhat worn. I visited the same field next day, but no more of these butterflies were to be seen.—W. GANDY; "Ravenscroft," Priory Avenue, High Wycombe, Bucks, September 12th, 1911.

COLIAS HYALE IN ESSEX. — On September 1st, at Ashingdon, Essex, I met with a solitary male *C. hyale* flying over lucerne. Although I visited some large lucerne fields in full bloom, I saw no others.—F. W. FROHAWK; September, 1911.

COLIAS HYALE IN KENT.—On August 29th I saw, but did not have an opportunity of securing, a specimen of *C. hyale* in a lucerne field near here. On August 30th I saw two *hyale* and caught one;

on September 2nd I saw three and caught two; and on the 5th saw two and caught both. Curiously enough these insects were all in two fields of lucerne, and though I have carefully worked all the lucerne fields around here, I have seen no other specimens of the butterfly.—H. HUGGINS; 17, Clarence Place, Gravesend, September 11th, 1911.

COLIAS HYALE IN KENT.—This species was obtained at Dover on August 26th.—H. FLEET, Junr.; 7, Park Road, Esher.

COLIAS HYALE in KENT.—I have taken this year, in the vicinity of Herne Bay, between August 20th and 27th, twenty-three fine specimens of this species.—W. H. C. BOLTON; 48, Philbeach Gardens, Earl's Court, S.W.

COLIAS HYALE IN KENT.—I spent the month of August at Margate, in company with my son, Mr. Reginald Spiller, who resides in that town. We made many collecting expeditions, and on the 16th I was agreeably surprised by taking a fine female *C. hyale*. After that, to the 19th inclusive, we captured eleven more, all in lucerne fields. Then for some reason they became very scarce, and to the end of the month, when I returned home, we only saw three specimens, one of them being at Sandwich. However, my son informed me that they re-appeared during the first week in September. He sent me on eleven fine specimens which he had taken, so that my series of Margate specimens now amounts to twenty-three. There were eight females amongst them, two of the same colour as the male, four paler yellow, and two white.—A. J. SPILLER; Godolphin Cross, Helston.

COLIAS HYALE IN ESSEX.—Yesterday (September 18th) twenty-seven *C. hyale* were captured at Ashingdon, by Mr. Charles Cork, who showed me the specimens, all of which are males. We visited the same locality to-day and captured five more, three males and two females, all freshly emerged. The lucerne in the neighbourhood has recently been cut; only a very little bloom remains in places, otherwise there is little doubt many more specimens would have been seen. —F. W. FROHAWK; Rayleigh, September 19th, 1911.

COLIAS HYALE IN EAST NORFOLK.—*C. hyale* occurred in some numbers near Palling, on August 12th, this year. A strong east wind was blowing at the time, and it was during the hottest of the August heat-wave. They stayed in the local clover-fields for three days and then went inland and I saw no more of them. I think they were migrating due west.—C. MELLOWS; Bootham School, York, September, 1911.

COLIAS HYALE IN SUFFOLK.—It may be of interest to record the capture, near Ipswich, on September 10th and 11th, of thirteen specimens of *C. hyale*, in perfect condition, by myself and a friend. —G. D. ARCHER; Whitton, near Ipswich.

At the present time (September 9th) there are large numbers of *C. hyale* in the lucerne fields, but I have not seen any example of *C. edusa* this autumn yet.—WALTER GOODCHILD, Junr.; The Laurels, Norwich Road, Ipswich.

Colias edusa in Kent.—I captured a fine male specimen of *C. edusa* on September 16th, near Bexley. Although a thorough search was made throughout the district, no other example of the species was seen.—L. W. Newman; Bexley, Kent.

Colias edusa in Essex.—A single specimen of *C. edusa* was noticed flying swiftly along a lane here late in August.—W. H. Harwood; 94, Station Road, Colchester.

Colias edusa in Cornwall.—One example of *C. edusa* was seen, flying swiftly, in the Penzance district during late August.—G. B. Kershaw; West Wickham, Kent.

Colias hyale and Sphinx convolvuli in Kent.—On August 23rd I found a somewhat worn specimen of *S. convolvuli* at rest on a fence between the North Foreland lighthouse and the edge of the cliff. On August 10th I took a magnificent female *C. hyale*, in a lucerne field near Margate; four or five other specimens were seen on subsequent days.—F. H. Stallman; 6, Maley Avenue, West Norwood, S.E.

Colias edusa and Sphinx convolvuli at Scilly.—Of butterflies at Scilly in August I saw *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Colias edusa* (2), *Gonepteryx rhamni* (3), *Vanessa urticæ*, *V. atalanta*, *V. cardui*, *Epinephele ianira*, and *Lycæna icarus*. Of these, *G. rhamni* is new to me in the locality. Of moths the total number of species would not much exceed the butterflies. Sugar was a comparative failure, and the only moth other than the commonest was *Sphinx convolvuli*.—B. W. Adkin; 8, Hope Park, Bromley, Kent.

Argynnis lathonia in Kent.—It will probably be of interest that I should record the capture, on the cliff at St. Margaret's Bay, Kent, on August 13th, 1911, of a very fair specimen of *A. lathonia* (female).—I. C. Gunton; 20, Sheffield Terrace, Campden Hill, W., August 9th, 1911.

Vanessa antiopa at Berkhamsted, Herts.—Mr. John Trask, one of the masters at Berkhamsted School, called on me some three weeks ago, stating he had, that day, seen a fine specimen of this insect near Ashley Green, but, having no net, was unable to catch it.—Arthur J. Rose; "Glanmor," Berkhamsted, September 19th, 1911.

Vanessa antiopa in Essex.—Two schoolboys, named L. Taylor and M. Green, who have been spending their holidays at Clacton, captured a good specimen of this insect at Bradwell-on-Sea on August 25th. I have seen this specimen, which is a male in good condition but somewhat damaged on the left fore wing.—Arthur J. Rose.

Vanessa antiopa in the Isle of Wight.—I write to record the occurrence here, at Brading, on August 17th last, of a very fine specimen of *Vanessa antiopa*. It was caught while resting on some flowers in the vicarage garden, and was brought to me. It is now in my collection. I believe another was seen in the neighbourhood about the same time. I should be very interested to hear if it has occurred elsewhere this year in the Island.—(Rev.) D. S. W. NICHOLL; Lansdowne, Brading, Isle of Wight, September 4th, 1911.

ACHERONTIA ATROPOS IN BERKS. — On July 20th some full-fed larvæ of *A. atropos* were brought to me, found in a garden here. They went to earth as soon as placed in a flower-pot, and a perfect male specimen emerged on September 6th. I think this a very short time to remain in pupa, and suppose the very hot weather was the cause.—W. E. BUTLER; Hayling House, Oxford Road, Reading, September 14th, 1911.

ACHERONTIA ATROPOS IN CORNWALL.—I have in my possession a fine male *A. atropos* that was taken at rest, on September 9th, by a young lady at Gurnard's Head, St. Ives. — LLOYD CHADWICK; 7, Northgate Street, Warwick.

ACHERONTIA ATROPOS IN SUFFOLK.—On the 7th inst. a pupa of *A. atropos* was brought me by Mr. H. Graves of this town; this I placed in damp peat and placed it in my desk which stands over a steam radiator, the temperature at night not falling below 78 deg. This morning, on opening the desk, I found the imago had emerged perfect; it was found when digging up potatoes.—HERBERT WM. BAKER: 73, Limetree Place, Stowmarket, Suffolk, September 11th, 1911.

SPHINX CONVOLVULI IN BERKS. — I should like to record the capture of a fine male *Sphinx convolvuli*. It was resting on a brick wall.—H. L. DOLTON; 27, Brunswick Street, Reading, September 13th, 1911.

SPHINX CONVOLVULI IN CORNWALL.—A specimen of *S. convolvuli* was picked up on the road to Penzance, about 7.30 p.m., on August 15th. It was a good specimen, but had evidently been injured in some way.—G. B. KERSHAW; West Wickham, Kent.

SPHINX CONVOLVULI IN DEVON.—At the flowers of tobacco plants in my garden I captured a specimen of *S. convolvuli* on September 9th and two on the 12th. I also saw one other specimen on the latter date.—J. WALKER; 7, Mount Hermon Road, Torquay.

SPHINX CONVOLVULI IN DEVON. — A specimen of *S. convolvuli* came into my house here on August 17th. Another example was flying around a tobacco plant in the garden a few days later.—E. G. HEBBUT; Berrynarbor, S.O., Devon.

SPHINX CONVOLVULI IN DORSET.—It may be of interest to readers that between thirty-five and forty specimens of this insect were captured here from August 26th to September 14th. All were taken at rest.—LEONARD TATCHELL; Karenza, Swanage.

SPHINX CONVOLVULI IN NORTH ESSEX.—A very large female of this species was brought to me in a very small box a few days ago, and there is no need to describe its condition. I have since heard of several specimens having been taken elsewhere within a ten miles' radius of Colchester.—W. H. Harwood; 94, Station Road, Colchester.

Sphinx convolvuli in Hants.—Two or three specimens of *S. convolvuli* have been taken in this neighbourhood. One was brought to me by a lady last week. It was a fine female, and was kept for eggs, but died without laying.—(Major) R. B. Robertson; Fairlawn, Chandler's Ford, Hants, September 8th, 1911.

Sphinx convolvuli in the Isle of Wight.—This species has been plentiful this season in the Island.—G. Nobbs; North Lodge, Isle of Wight.

Sphinx convolvuli in Kent.—It may be of interest to record the capture of a fine female of this insect on August 29th, flying at dusk round *Nicotiana affinis*. Another specimen was seen on September 3rd in the same place. — Geoffrey Meade-Waldo; Hever Warren, Kent.

Sphinx convolvuli in Surrey.—In the evening of September 12th I had a perfect male specimen of *S. convolvuli* brought to me alive. It had flown into the kitchen of a house on the outskirts of Haslemere, doubtless attracted by a strong light in the room. Another specimen, taken at rest on the morning of September 16th, is also in my possession. I may mention that there are a considerable number of petunias and tobacco plants in flower growing near the spot.—Bertram E. Jupp; Lyn Lodge, Camelsdale, Haslemere.

Sphinx convolvuli in Surrey.—A specimen of this fine hawk-moth was taken in a garden, High Street, Esher, on September 6th. —H. Fleet, Junr.; 7, Park Road, Esher.

Sphinx convolvuli in Suffolk.—Two specimens of *S. convolvuli* were captured, whilst hovering over petunias, on September 12th.—G. D. Archer; Whitton, near Ipswich.

Sphinx convolvuli in Sussex.—Doubtless many of your correspondents have rejoiced in a good season for this insect, and I should only record the capture of five specimens in this small garden for special reasons. Chief among them is the fact that, although we have some fine plants of *Nicotiana*, a bed of evening primroses seems to be the chief attraction. I would further mention that four out of the five moths have been netted as late as nine o'clock, when I have managed to see them by shadowing the plants against the bright moonlight. My last capture—a female in fine condition—has been rather reluctantly reserved for egg-laying purposes; I say "reluctantly," because I have no experience of obtaining eggs from hawk-moths, and have only the flimsiest hopes of any success.—J. S. Carter; Iden, Sussex.

Sphinx convolvuli in Sussex.—A fine female specimen of *S. convolvuli* was brought to me alive early this month.—Wm. Delves; Horeham Road, Sussex, September 22nd, 1911.

Sphinx convolvuli in Warwick.—A female specimen of *S. convolvuli* was brought to me on August 28th last. It was found at rest on a wooden shed in this town on the morning of August 26th. The tips of the fore wings were damaged, owing to the moth having been confined in a small box; otherwise it is a fine specimen.—LLOYD CHADWICK; 7, Northgate Street, Warwick.

H. ARMIGERA AND S. CONVOLVULI IN GLAMORGANSHIRE. — I should like to record taking *H. armigera* while sugaring on the sea-coast near Bridgend on August 15th. The moth is in good condition; I only know of one other specimen having been taken in South Wales, *viz.*, by Sir J. T. D. Llewelyn, of Penllergare, near Swansea. There seems to have been a considerable invasion of *S. convolvuli* this year. My son, H. E. David, netted two fine specimens off the flowers of the white tobacco plant, on August 17th and 19th, at the same place as I took *H. armigera.* I also had two other moths given to me, which were found at rest in the daytime, one from Foumon Castle grounds, Glam., and the other from East Knoyle, Wiltshire.—E. N. DAVID; Yscallog, Llandaff, Glamorgan.

COCCIDÆ AFFECTING RUBBER TREES.—In the 'Journal of Economic Biology,' May, 1911, Mr. E. E. Green has a very interesting paper on Coccidæ found on rubber trees in Ceylon. In two instances, however, I venture to disagree with his nomenclature, as follows:

Cardiococcus castilloæ (Green): *Inglisia castilloæ*, Green, t. c. p. 29.

Lepidosaphes rubrovittatus, Ckll. 1905 (Philippine Is.): *Mytilaspis fasciata*, Green, t. c. p. 31.—T. D. A. COCKERELL.

A SECOND BROOD OF L. SIBYLLA.—To-day, while I was hunting for larvæ among young aspens in a wood not far from here, I was greatly surprised to see *Limenitis sibylla* settle on a bramble-leaf close to me. I watched it for some moments while it gently raised and lowered its wings, and then it floated gracefully off to another leaf. "This surely cannot be a retarded specimen," I said to myself; "it is far too late for that; it must be one of a second brood." I went on, and in the course of an hour saw six or seven more, all quite fresh and exceptionally fine. One particularly large female allowed me to approach quite close to her, and I tried to catch her between my finger and thumb as she sat on a leaf, but she would not quite allow this piece of familiarity, and if she had I should not have kept her, as the butterfly is getting very scarce in this neighbourhood. Of course these were all individuals of a partial second brood, due to the abnormally hot, dry summer, but I believe it is an unprecedented event, for I can find no records of any second brood in any of my entomological books, though I have not been through all the back volumes of the magazines. I should like to know if anyone else has ever met with, or heard, of a second brood. It does not appear to be double-brooded on the Continent, though its near ally, *camilla*, is undoubtedly so in the South. The first butterfly I noticed this year was on June 14th. I was in the wood on several occasions during August and the beginning of this month, but there were none about then, so those I saw to-day can only have just emerged.—GERVASE F. MATHEW; Lee House, Dovercourt, September 19th, 1911.

OBITUARY.

Albert Harrison, F.L.S., F.R.M.S., F.Z.S., F.C.S., F.E.S., &c.

As briefly announced in our last number, Mr. Harrison died on August 28th. He was born in 1860 at the New Pale Farm, near Frodsham, Cheshire, and was educated at the Liverpool Institute. In 1875 he went to the laboratory of Messrs. Henry Tate and Sons, sugar refiners, in Liverpool, thence he was transferred to the London branch, of which he became manager in 1878. By the Directors he was held in great esteem, and he won the respect of all with whom he came in contact.

From his boyhood upwards he was keenly interested in Natural History, and as Delamere Forest was just on the border of some of the fields of Pale Farm, he had splendid opportunities for obtaining practical knowledge of the fauna and flora of that locality.

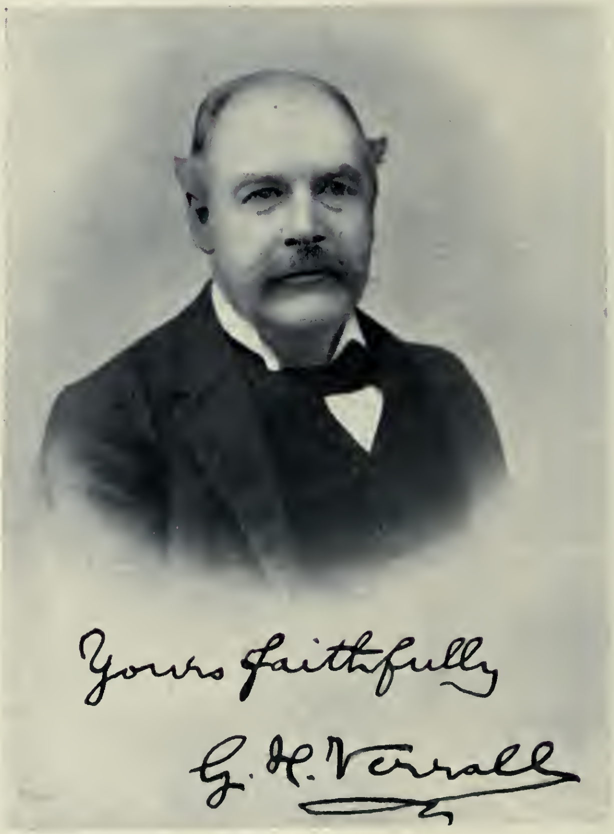
After coming to London he commenced a systematic study of biology, and in 1888, in co-operation with his friend Mr. Hugh Main, began the collection and study of insects generally, and of Lepidoptera specially. Joining the South London Entomological and Natural History Society in 1892, he soon became acquainted with all its active members. One immediate result of this was that the rearing of insects from the earlier stages became a feature of his labours. He was also attracted by the work being done in connection with Mendel's laws of heredity, and applied his experience and facilities to experiments in this direction. The local variation of *Pieris napi* was a subject in which he had been interested for some time, and unaware of previous investigations on the same lines, he tried the effects of crossing the var. *bryoniæ* from Switzerland with British *napi*. The results were very interesting, but so far no explanation of them on Mendelian lines has been found (see Trans. Ent. Soc. Lond. 1908). Another species, on the variation of which experiments were made, was *Aplecta nebulosa*. Mr. Harrison collected the larvæ of this species in Delamere Forest, where vars. *robsoni* and *thompsoni*, together with the grey form, occur. It appeared from the results of a number of crossings that it was a parallel case to that of the Blue Andalusian Fowl; but from the results obtained this year the matter does not seem quite so simple, and further experiments are still required to elucidate it (see Trans. Ent. Soc. Lond. 1911).

Mr. Harrison was taken suddenly ill on the evening of August 27th, and passed away about 1.30 a.m. the next day from hæmorrhage on the brain.

He will be greatly missed by a large circle of friends, to all of whom he had endeared himself by kindly words and generous deeds.

We have to announce, with very deep sorrow, that our colleague Mr. George Henry Verrall, died on September 16th.

The Entomologist, November, 1911. Plate VIII.



Yours faithfully

G. H. Verrall

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GEORGE HENRY VERRALL, F.E.S.

(Plate VIII.)

George Henry Verrall, of Sussex Lodge, Newmarket, who died on September 16th after a somewhat long and harassing illness, was born at Lewes on February 7th, 1848, and was therefore in his sixty-fourth year. Educated at the Lewes Grammar School from 1857 to 1864, his early taste for entomology and botany was fostered in a congenial atmosphere among the beautiful Sussex Downs, which have inspired with the true love of Nature so many of her most ardent disciples.

At first secretary to his eldest brother, the late Mr. Fred. Verrall, he afterwards joined the well-known firm of racecourse managers and bankers, Messrs. Pratt & Co., and was concerned as auctioneer with the sale of many famous racehorses. And in this connection it is interesting to know that from among the heirlooms of his family he possessed a hammer of solid gold, "to commemorate the triumph of integrity, March 21st, 1842," presented to his uncle, the late Mr. P. Verrall, which was exchanged for the customary hammer whenever the bidding rose above four figures! But though intimately associated with the Turf in all its branches, he has told the writer of this notice that he never made a bet on a horse. He was, indeed, as fearless a critic of the methods of some so-called "sportsmen" as he was the enemy of all that suggested a mean and sordid approach to the greater questions of life; nor was his outspoken criticism ever levelled at those who did not deserve it. So it happened that, when at length he was persuaded to enter the lists as a Parliamentary candidate, he was as popular with his opponents as with his supporters. Mr. Verrall's tenure of the East Cambridgeshire seat, which he wrested from Sir Charles Rose on January 24th, 1910, was not destined to be long maintained, however; and, after but nine months of Parliamentary life, the former occupant was reinstated. No doubt the great strain of two winter elections in a single year was the beginning of the end for him. A short time since he had announced his decision to retire from the political arena; and though he took several weeks' holiday on the South Coast this spring in search of health, those of us who saw him when he returned were profoundly impressed with his changed appearance. But nothing could affect his genial temperament, or his interest in business and social engagements.

As entomologists it is not our province to dwell upon the professional and political aspects of Mr. Verrall's career. When only eighteen years of age he joined the Entomological Society of London, by whom his services as sometime Secretary were widely appreciated; and we who are also members recall that to his election in 1887 was largely due the reorganization—I may say, perhaps, the resuscitation—of the Entomological Club, of which, with the exception of Dr. B. T. Lowne, no longer an active member, he was at the time of his death the *doyen*.

Mr. Verrall was elected a member of the Entomological Society in 1866; it then consisted of only two hundred and seven members, and, when thirty-two years later he succeeded Mr. Roland Trimen in the Presidential Chair, he could say that but thirty-four had survived him. My own term of service as one of the Honorary Secretaries commenced in 1900, his second year of office; but unless I had happened to attend the famous "Annual" of the Entomological Club under his chairmanship in January, 1900, I am quite certain I should never have offered myself as a candidate for this post. So cordial and so encouraging was Mr. Verrall, however, when the suggestion was made by one or two of his guests that I did not hesitate for a moment: and I may add I owe to him, in great measure, the eleven most agreeable years of my entomological life.

But I introduce this personal experience merely as an instance of the unvarying kindness which inspired his smallest actions. His great idea in these Entomological Club suppers of his was to bring together entomologists of all ages—the students of all Orders, scientific as well as unscientific. Every year I used to receive a letter from him asking for the names of new Fellows who had joined our ranks and others likely to do so, and in what proved to be his farewell speech to the Club last January, when the disappointment of a political reverse was heavy upon him, he was consoled obviously by the reflection that the number of his guests exceeded that of any similar occasion. Indeed, there could not have been far short of a hundred present. His custom of making the supper-table the occasion for a review of current social events in the entomological world added a pleasant zest to the proceedings.

More than once in the recent history of the Entomological Society there might have been something worse than a teacup storm had not Verrall, speaking openly and frankly, poured oil on the troubled waters! He always spoke his mind, and whether in his business, on the political platform, or in friendly discussion from the Chair, his remarks were distinguished by scrupulous honesty of purpose, and his commonsense advice and counsel were, therefore, the more gratefully received and acknowledged. Moreover Verrall, though by length of service a veteran in the field, kept pace with the modern developments of science which eventually brought entomology into the recognized forefront of the battle for knowledge. His heart was one with the "Young Guard"; in an entomological, as well as in a general, sense he never grew old, and no more remarkable proof of his intellectual energy can be given than that but a few years back he undertook the onerous work of cataloguing, describing, and figuring the three thousand or so species of British Diptera in a thoroughly scientific manner. The volumes already published—v. Stratiomyidæ, &c. (1909), and viii. Syrphidæ, &c. (1901)—are an earnest of what this great work was intended to be, and in no department will he be more sincerely mourned and missed than among our Dipterists, some at least of whom have been encouraged to proceed upon their way in this neglected branch by his patient and sturdy example.

With the termination of the late Edward Newman's proprietorship of 'The Entomologist,' and the commencement of our present Editor's term of office one-and-twenty years ago, Mr. Verrall's name appears in the list of specialists invited to join the Reference Committee; and on many occasions since he has given us the benefit of his wide knowledge.

Perhaps, however, the greatest service rendered his brother scientists was the part he played, and the generous share he took, in saving the last of the Cambridgeshire fens from the fate which has befallen so many similar strongholds of Nature. We owe it to him, and to Mr. Walter Rothschild, indeed, that the greater part of Wicken has become "a national trust," wherein the naturalist and the botanist may pursue their investigations, and the special marshland fauna and flora may continue to flourish unchecked. So that, if Verrall is remembered in the constituency which he represented for all too short a time as Member for Newmarket, we entomologists shall always acclaim him, as we did a few years back, as the Member for Wicken!

Of the value of his achievements as a lifelong devotee to the study of Diptera I am hardly entitled to venture an opinion; but certain it is that no one possessed better qualifications than he did for the work. By virtue of his magnificent collections and complete library of reference, backed with forty years' experience in the field, he could justly claim the right to be heard and accepted as an authority of the first rank.

In the realm of science his untimely death creates a void not easily to be filled. May his memory long be kept green in the hearts of the many naturalists to whom he was ever friend and cheerful counsellor!

He leaves a widow, to whom we offer our sincere sympathy, but no son or daughter.

His collections, subject to certain reservations in favour of the British Museum (Natural History), and library are bequeathed to his nephew and scientific helper, Mr. James E. Collin, F.E.S.

H. Rowland-Brown.

FURTHER NOTES ON THE BRITISH CICADA, *CICADETTA MONTANA* (HEMIPTERA).

By G. T. Lyle.

Since writing my notes on our native Cicada, now some two years ago (see Entom. xliii. 1), I have had several opportunities of improving my acquaintance with this scarce British insect and its habits.

On June 3rd, 1910, I searched the known breeding-ground most thoroughly, but could find no trace of nymph-cases, and it was not until June 20th that I was successful in finding one, and two others rewarded my search on the 27th. My first visit to the locality this year (1911) was made on June 5th, when I soon found a nymph-case, and also heard two of the bugs singing, but, unfortunately, could not locate either.

On June 11th two or three of the insects were singing at 11 a.m., and at 11.30 I was fortunate enough to see one on the wing. It was flying along, some two feet or so above the fern, with a fairly strong flight, its wings glistening in the sunlight. At first sight this insect appeared, while flying, to resemble *Libellula depressa*, although the flight was neither so strong nor so graceful as that of the dragonfly. This specimen, which I netted, turned out to be a fine female. It made no attempt whatever to escape from the net, but remained quiescent with folded wings. On this day the singing of the Cicadas was almost incessant, but it was not until the afternoon that I succeeded in locating one in a pine-tree, some twelve feet above the ground. On being dislodged, it flew with a somewhat slow, heavy flight, into a neighbouring furze bush, where in the course of a few minutes it recommenced singing. The flight of this male was neither so light nor so rapid as that of the female which I captured in the morning.

Unlike some of its foreign relatives, our Cicada can scarcely be described as a noisy insect, although its note is certainly very penetrating. I have heard its "song" described as a hum, as a buzz, and as a whistle, and to my ear it appears to partake of the nature of all three, reminding me of nothing so much as the monotonous "whirr" of the nightjar (*Caprimulgus europæus*), pitched on a much higher and more musical note. The song swells in volume as it proceeds, and then dies gradually away, occasionally ceasing suddenly. It is not continuous, the musician taking frequent rests, which may last for several minutes. I found that I could distinctly hear the note twenty yards away, at which distance it might easily have been mistaken for a "singing in the ear."

During the next fortnight I heard Cicadas several times, and found that, with practice, I could more easily locate them, and so disproved my original idea that they possess ventriloquial powers. The males seem to prefer the lower branches of the pine-trees from which to show off their musical abilities, though on one or two occasions I found the singer in a hawthorn bush. The insects become silent before sunset, and on dull cloudy days do not appear to attempt a song.

On June 14th Messrs. Claude Morley & E. A. Elliott captured, at the same locality, a male, which was singing on a frond of bracken. In this case I think it probable that there was a newly emerged female in the immediate neighbourhood, as seems to have been generally the case when males have been noticed on the ferns. On Coronation Day, June 22nd, the weather broke up and, in spite of the fact that it soon returned to its previous torrid condition, I neither heard nor saw anything of *C. montana* afterwards.

During the past season I have found some six or eight empty nymph-cases, all of which were lying loose on the turf under the bracken, within a space of some three by two yards. Careful search was made over a much larger area, but no others were discovered. In previous years they have been much more widely distributed.

There is little doubt that the majority of recorded specimens, as well as the much larger number of insects that have been captured and sold by local professional entomologists, were taken in the neighbourhood of which I have written; but it would be absurd to suggest that there are not other breeding-grounds in the New Forest. In 1901 I captured a male near Lady Cross Lodge, some two miles away, and I am indebted to Mr. Claude Morley for calling my attention to a record of a specimen taken by Mr. W. R. Buckle on June 7th, 1886, near Rufus Stone (Entom. 1886, p. 283), which is at a distance of seven miles.

In the National Collection are thirteen British specimens of *C. montana*, particulars of which have been kindly given to me by Mr. Morley. These, I think, may possibly be of interest.

Two (male and female), New Forest (Bramwell); presented by Mrs. MacCulloch in 1856. One, "J. J. Weir," New Forest, 1879; Douglas Coll. in coll. Mason, bought in 1904. One, New

Forest, 1880, Douglas Coll. in coll. Mason, bought in 1904. One (male), Lyndhurst, June 17th, 1885, Douglas Coll. in coll. Mason, bought in 1904 (in F. A. Marshall's writing). Four, ex coll. Stephens. Three "Gulliver," Lyndhurst, New Forest, June, 1892; presented by F. C. Adams in 1893. One, "G. Lewis," New Forest, June 17th, 1895, Douglas Coll., in coll. Mason, bought in 1904.

Brockenhurst: August 18th, 1911.

A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

By H. Rowland-Brown, M.A., F.E.S.

(Continued from p. 308.)

(ii) *The Basses-Pyrénées. Eaux-Bonnes.*

I can hardly claim any particular originality in the choice of the hunting-grounds described in the first part of this paper. The coast from Biarritz to St. Jean de Luz is by no means "unexplored." On the contrary, many British collectors on the way to Spain, or returning from the Central Pyrenees, have visited this region, and given us the benefit of their experiences. The reason I selected Guéthary was the reputed abundance of *Cœnonympha œdipus* in that locality, and if Guéthary failed us, then there was Biarritz only a little way off, where I had overtaken the rear-guard of the species in August, 1905 (Entom. vol. xxxviii. p. 273), and three weeks earlier in the field might ensure a bag of this interesting butterfly in good condition.

Our opening day, July 2nd, was not auspicious—hazy, with mist blowing in from the sea, and the not-very-distant Pyrenees cloaked with heavy cloud. There were, however, gleams of sunshine at intervals, but neither then, nor at any time, were butterflies on the wing. I attributed their absence, of course, to the weather; but in the event the only conclusion possible was that Guéthary as a hunting-ground was a failure. Both on this day and the 4th, when the sun shone brilliantly, we quartered the country inland for miles over what suggested an ideal ground for our purpose—marshy heath and rough pasture, with occasional scrubby oak-woods. But *C. œdipus* was nowhere to be found, only the commonest species; my own captures being limited on these two occasions to two very fine *Lampides bœticus* (females), the largest I ever saw, a few fresh *Brenthis dia*, and one fine *Colias edusa* ab. *pallida*; though Mr. Warren took several more of the latter in the rough fields near the cliffs. The only really plentiful butterfly in evidence on the heaths was *Rusticus argus*, L. (*ægon*)—all males; while a battered female

Limenitis camilla furnished a few eggs, which were successfully hatched, and the larvæ bred for the second seasonal emergence in England by Mr. Warren. In a deep shady lane at one place the males of *L. sibylla* were also in force disputing the bramble blossom with hosts of *Epinephile jurtina*; occasional examples also of *Everes argiades* (*amyntas*) were picked up from the tall grasses.

Guéthary proving hopeless, we made two expeditions to Biarritz, but the first day, July 3rd, was again dull and hazy, and we only discovered really good ground after lunch on the second day, July 5th, which reminds me that practically all that *was* taken on the 3rd was our *déjeuner*, which I had hidden, as I thought, in perfect safety among the fern beneath a bush. Some keen-nosed native appropriated the *poulet* and eggs, leaving us but a modest ration of bread and cheese, though fortunately I had a few pieces of chocolate in my pocket. All this took place on the ground which I had found so rich in butterflies on my former visit. But on this occasion, as at Guéthary—and it could not have been due to a retarded season, for the conditions in South-west France had been quite normal—insects were conspicuous only by their absence. A fine fresh brood of *Strymon ilicis* haunted the low, broken-down hedges, and *E. argiades* again was fairly common. *R. argus* (males) abounded, but nothing else, save for "skippers," one or two *Thymelicus actæon*, *Augiades sylvanus*, a single *Hesperia sao*, and a single, much-wanted *H. malvoides*, Elw. & Edw. (=*fritillum*, Rbr.).*

Superficially, *malvoides* differs from the *malvæ* of the Basses-Pyrénées by the much enlarged white spots. But this local difference apparently is not constant in the Alps; and it is by close examination of the appendages alone that the fact has been established that the spring *malvæ* and the summer (*fritillum*) *malvoides* are entirely different species, as Rambur—that master of correct entomological diagnosis—long since suggested. In the field, however, there should be no difficulty in distinguishing these two Dromios! *Malvæ*, as with us, is an early spring species, is single-brooded, and over before *malvoides* puts in an appearance. Thus it is only when we look over our series in the cabinet and have omitted to affix date-labels that the puzzle is disconcerting.

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* In the 'Bulletin de la Soc. Lépid. de Genève' (vol. ii. fasc. 2, Aug. 1911), as the result of full and patient investigation, Dr. J. L. Reverdin distinguishes in masterly style the Hesperiids known to collectors as *fritillum*, Rbr., *fritillum*, Hb., and *malvoides*, Elwes & Edwards. "No doubt remains," he says, "as to the identity of *fritillum*, Rbr., and *malvoides*, Elw. & Edw., and if the name of *fritillum*, Rbr., should be replaced as preoccupied, what better denomination can be bestowed upon it than that of *malvoides*? Have I not shown that the so-called *fritillum*, Rbr., is so analogous to *malvæ* that I could discover no constant distinguishing character? Indeed, it resembles *malvæ* as closely as it is possible so to do, and the appellation of *malvoides* acknowledges this resemblance in the happiest manner."

Our second visit to Biarritz was rather more productive in numbers, and the lower marsh country nearer the station at the far end of Lac Mouriscot was a decided improvement on the locality chosen earlier in the day. Hereabouts I took a single perfect male *Heteropterus morpheus* (evidently only just emerging), a few *Lampides bœticus*, and *Everes argiades* females; and on the upper road the sand-banked hedges hung with ivy and clematis afforded covert for an extremely yellow-fulvous form of *Pararge egeria*.

On the 6th, not without reluctance on my part—for the weather was now settled and fine, and the sea-bathing, from my bedroom at the extremely comfortable, clean, and well-managed Hotel de la Plage, excellent—we set out in the early morning for Eaux-Bonnes, travelling by Pau and Laruns, with a short drive at the end of the journey to this once favourite watering-place. I say *once*, for there is an indescribable atmosphere of yesterday about Eaux-Bonnes. The town is almost entirely composed of hotels, pensions, and lodging-houses for the benefit of guests who never come apparently, and it remained empty all the time we were there; despite the list of "worthies" who have patronized the waters, including Mr. Joë Chamberlain (*sic*). Otherwise, that list is chiefly made up of Second Empire social celebrities drawn thither when the Emperor was doing his best to popularize and make fashionable the beauty-spots of the Pyrenees.

"Too low a level" was our immediate verdict after examining the entomological possibilities of the place; while the beech-woods densely clothing the narrow ravine, into which Eaux-Bonnes is squeezed, confirmed our first impressions that we should have to climb at least 1500 ft. above the town to find the desired hunting-grounds.

Consulting the map on our journey, I had come to the conclusion that the high ridge between Eaux-Bonnes and Eaux-Chaudes promised the best results among the alpine butterflies, as afterwards proved to be the case when we climbed up to the Col de Lurdé (6400 ft.), or the valley immediately beneath it facing east beneath the Pic de Goupey (7245 ft.), on July 7th, 10th, and 12th. With the exception of some mist on the 12th, all three days were exceptionally fine, and this only made the scarcity of species, as well as of specimens, the more vexatious. The first part of the walk is a steady grind up long zigzags, protected from the fierce heat by a cool forest of beech, in which, of course, we saw nothing but an occasional battered *Pararge egeria*. Emerging after about an hour into the pastures, the first butterfly was *Erebia stygne*, evidently just emerged, for we saw no females on the 7th; but, with the exception of numerous

Pyrameis atalanta, hardly anything else was flying. And here, as everywhere else at Eaux-Bonnes, there was an extraordinary dearth of "blues" and Melitæas, while I think the only brown fritillaries we saw in our week's stay were *Brenthis pales*—one or two on the rhododendrons at about 5500 ft.—a casual *B. dia*, and very worn *B. euphrosyne*. A few *Cupido minimus* and very occasional *Lycæna arion* almost complete the list of Lycænidæ represented. Higher still, and immediately below the Col, we began to find butterflies more plentiful. The shaly, rather precipitous, walls on each side, covered in places with flowers and grasses, but for the most part bare, suggested *Erebia lefebvrei*, and we had already netted some rather worn *E. lappona* var. *sthennyo* at the entrance to the ravine. The sunny side soon yielded the rarer *Erebia*, and we spent the rest of the morning balancing ourselves as best we might on the slippery slopes of moving stones which are so dear to this warmth-loving species. But the moment the sun was hidden by a cloud, they disappeared like magic. My Eaux-Bonnes *lefebvrei*, contrasted with those from Gavarnie, run rather larger as a whole, while I can detect none in which the chestnut antemarginal band, so pronounced in many of the Gavarnie examples, is at all developed. But *lefebvrei* is one of the most variable of insects, and I have not enough material before me to determine whether the obsolescence of the antemarginal band is a constant feature of the more western examples. Among the rhododendrons also we netted a few *E. epiphron* var. *cassiope*, Mr. Warren securing a female with white ocellations, and several ab. *nelamus*, while a single *E. tyndarus* var. *cassioides*, von Hohenw.* (*dromus*, Fabr.), was evidently the forerunner of the seasonal emergence. The only other butterflies, hereabouts, which could be called at all abundant were some very large *Gonepteryx rhamni*, but to the top of the Col, where we climbed for lunch and where there is one of the very rare mountain springs, hardly a butterfly was on the wing; so that on each subsequent visit we did not trouble to proceed further than the *lefebvrei* ground. It was here also on the rock-strewn grass that I noticed a black and white "skipper"—in our experience the only one met with in the mountains hereabouts. Unfortunately I missed several, but Mr. Warren was more successful, and bagged some half-dozen of what, to our surprise, turned out to be *Hesperia andromedæ*. This is, I believe, the first publication in England of *H. andromedæ* as a Pyrenean butterfly †; but on looking through

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* 'Bulletin de la Soc. Lépid. Genève,' vol. i. p. 215.

† This statement requires some qualification. Since I wrote it I find that I had overlooked a passage in Dr. J. N. Keynes's account of "Butterflies in the Pyrenees in 1909" ('Ent. Record,' vol. xxii. 1910, p. 109). He says that, collecting with Mr. G. L. Keynes at Gavarnie on July 9th, "we were fortunate to take two specimens of what we believe to be *Hesperia andromedæ*. . . . We do not remember seeing any previous record of this

M. Oberthür's 'Lépid. Comparée,' fasc. iv. pp. 397–8, I find the following interesting announcement: "Mrs. de la Bâtie [Beche] Nicholl has written me that she found *Syricthus andromedæ* in the Hautes-Pyrénées. For myself, I have seen no Pyrenean examples. I have taken the species in the Bernese Oberland at the end of June, 1898; but I do not believe, all the same, that it has been met with up to now in the French Alps authentically. It does not follow, however, by any means that *S. andromedæ* could not be a Pyrenean species, as Mrs. Nicholl appears to be convinced it is." *

Later on, when I had the good fortune to meet M. Charles Oberthür at Gavarnie, I was able to show him the small series of Mr. Warren's Pyrenean *andromedæ*, and I understand that a pair are to be figured in the 'Études' of some future date, with my note relative to the circumstances of capture. Mrs. Nicholl tells me that her examples were secured some fourteen years since near the Lac Vert (6430 ft.), which is in the Hautes-Pyrénées, and about four hours up from Luchon, very close to the Spanish frontier: therefore considerably east of Eaux-Bonnes, and suggesting that the range of *andromedæ* in these mountains is wide, even if it does not occur throughout the entire chain at sufficient altitudes.

Had I read the Baron de Selys Longchamps's note on the Rhopalocera of Eaux-Bonnes fifty years ago, before I started on my exploration of the mountains there, instead of a month or so after my return, I think it extremely probable that I should have tried my luck elsewhere. His account of a three weeks' visit from June 15th to July 10th, 1857 ('Bull. Ent. Soc. France,' 1858, p. lxxii.) is not encouraging. In all that time he only encountered forty species, of which "the most remarkable were *Anthocharis simplonia*, *Carcharodus altheæ*, and *un Syricthus à déterminer*. There was but a single *Erebia* (and of course it was *E. stygne*). . . . This fact should suffice to persuade an entomologist to choose any other locality than Eaux-Bonnes as the objective of an excursion in the Pyrenees."

One wonders whether that "*Syricthus* à déterminer" *was*

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species from the Pyrenees, and perhaps this is not surprising, considering its obscurity and apparent rarity." Dr. Keynes also informs me (*in litt.*) that neither he, nor Mr. Wheeler, feel any doubt that these two specimens are genuine *andromedæ*; a species with which they are well acquainted elsewhere.

* I find among the extra-Swiss localities for the species in Mr. Wheeler's 'Butterflies of Switzerland,' p. 6, under *H. andromedæ*, "Allos, July 15th–18th, 1899 (Powell)"; and I think this record must have escaped M. Oberthür, as Mr. Harold Powell, F.E.S. is an authority we can all trust and follow with perfect confidence. Millière's "La Turbie, May," is a most unlikely record. La Turbie is only 1594 ft. above Monte Carlo and the sea-level; and Millière seems to have had a bad eye for the identification of "macros"!

ever identified, and whether after all it may not have been *andromedæ*! I can find no record of the Baron having pushed his enquiries further. Probably, like the majority of collectors, having read half-a-dozen descriptions of "skippers" which "might be it"! and pored over as many imperfectly executed coloured plates, he gave it up as a bad job. At Biarritz, a month later, I observe, he had further accumulated "deux ou trois espèces à étudier." From the remark about Erebias, however, I am inclined to think he never got higher than the grass interval between the beech-woods and the upper zone, where certainly we found more than his single *bête noire*—*stygne*. Unless, therefore, we had ascended far up under and on to the Col de Lurdé, I do not suppose we should ever have seen *andromedæ* in the Pyrenees. Mr. Wheeler does not suggest a zone limit for the species in Switzerland; the one or two examples in my collection I took high above Berisal, under the Wasenhorn, at not less than 6500 ft.; and above Franzenshöhe, on the Stelvio, which would be 7000 ft. at the lowest. Frey says that in the Austrian Alps it occurs at 4000 ft., but this must be exceptional, if authentic.

On July 8th we explored the Val de la Sourde, the valley reaching far up into the mountains directly south-east. Heavy rain had fallen in the night, the air was still and oppressive, and in the rare forest-clearings only an occasional *Leptosia sinapis* fluttered languidly. About noon, however, we had come to a very steep piece of rock on the opposite side of a snow-strewn valley under the Pic de Ger, having caught absolutely nothing; and here but a few worn *Erebia lappona*, and the sight of a distant herd of *issard*—the Pyrenean chamois—rewarded our labour. While soon after the rain came rushing down, and we were forced to spend an hour or so in a shepherd's hut—the only place in the whole day's excursion where drinkable water was procurable. On the 9th, Mr. Warren spent the morning, which was again very sultry, in some meadows below the town. A few *Anthocera brizæ* fell to his net, but no captures of any note. On the 11th, after a long walk under a tropical sun we arrived at the Col d'Aubisque (5610 ft.), on the route to Argeles, only to be baffled once again by a cold wind-driven mist at the summit. I think, however, that we did not miss much in this quarter, as the grass and mountain-sides were grazed close by innumerable flocks, and even where the sun was shining lower down, the lack of insect-life was due, I think, to the poverty of the vegetation rather than to climatic drawbacks.

The subjoined list is made up chiefly, therefore, of butterflies taken or observed in the neighbourhood of the Col de Lurdé, for though we overhauled the maps, and reconnoitred in all directions, we could find no better, indeed no other, ground which offered so fair a chance of increasing our knowledge of the western Pyrenean Rhopalocera.

Eaux-Bonnes, July 6th–12th.—*Hesperia andromedæ; Thymelicus lineola; Lycæna arion; Cupido minimus; Nomiades semiargus, Polyommatus corydon, P. hylas, P. icarus; Rusticus argus; Strymon ilicis; Papilio machaon*, one or two flying round flowery slopes leading up from the Plateau d'Anouilles; *Pieris rapæ; Anthocharis simplonia*, an odd example or two, very worn, under the Col de Lurdé; *Leptosia sinapis; Colias edusa; Gonepteryx rhamni*, all examples met with of large size in both sexes, not uncommon; *Issoria lathonia; Brenthis euphrosyne, B. dia, B. pales*, a fine bright form just coming out in the rhododendron region; *Melitæa parthenie*, very dark (one example); *Pyrameis cardui, P. atalanta; Aglais urticæ, Eugonia polychloros*, outskirts of town; *Pararge mæra*, var. *adrasta, P. hiera*, very worn, one example under Col de Lurdé; *P. egeria*, common in the beechwoods; *Cœnonympha pamphilus; Erebia epiphron*, var. *cassiope*, and ab. *nelamus*, on rhododendrons, just emerging; *E. stygne*, common generally above 4000 ft.; *E. evias*, one or two rather higher up than *stygne; E. lefebvrei; E. tyndarus*, var. *cassioides*, just coming out; *E. lappona*, var. *sthennyo*, all examples, as in the central Pyrenees generally, referable to this variety; *Melanargia galatea*, below the town. Thirty-six species in all.

I may add that on the Col de Lurdé I encountered also, for the first time, the dark little *Hepialus alticola*, Obth., which is about the size of *H. lupulina*, but of a dusky black upon a somewhat yellowish black ground-colour. At rest on a grass bent, it bore a striking resemblance to *Nisoniades tages*, and it was this, no doubt, which attracted my attention to the species. It seemed fairly common at this spot, but it was not until I was collecting under the Pic d'Astazou a week later at Gavarnie that I found it abundant, and made acquaintance with the extraordinary grub-like apterous female.

(To be continued.)

SOME BEES FROM FORMOSA.—I.

By T. D. A. Cockerell.

The bees discussed below are part of the great Sauter collection, now in the Berlin Museum. The collections of Mr. H. Sauter have added to our knowledge of the fauna of Formosa in so many different groups that his name is familiar to all students o Asiatic animals. The collection of bees is rich in new species, represented by long series of excellently preserved specimens, but includes neither new genera nor very peculiar representative of known genera. The Formosan bee-fauna is closely related t that of tropical continental Asia, but contains in the mountains a distinct palæarctic element. As Friese has remarked, there is no particular affinity with the bee-fauna of Japan; nor is there any evident Philippine element.

Ceratina unicolor, Friese, 1911.

Described from the female only. Thirteen specimens from Formosa (no special locality given) enable me to add some details.

♀. Varies greatly in size; length, 9 to 11 mm.

♂. Length, 6½–8½ mm.; resembles the female except in the usual sexual marks; face-markings pale yellow or ochreous, including clypeus except broad upper and lateral borders, a small supraclypeal mark (often reduced to a minute dot), broad bean-shaped lateral face-marks, the greater part of labrum, and usually a small spot on each mandible; anterior femur, tibia, and basitarsus each with a yellow stripe; apical segment of abdomen broad, little produced at end, where it is truncate and subemarginate.

Anthophora urens, n. sp.

♂. Length 12–15 mm., robust, black, with the head and thorax above, and the pleura, covered with very bright fox-red hairs, mixed with black except on pleura and upper part of cheeks; front with hair mixed red and black, lower part of face with coarse black hair, under side of head with long pure white hair, under side of thorax with creamy-white hair; eyes red-brown; inner orbits parallel, gently concave above; tongue very long (fully 11 mm.); maxillary palpi long and slender, with the second joint at least as long as the third to sixth together, the following ones successively shorter, the sixth extremely small; paraglossæ about 2 mm. long, sharply pointed, not hairy; labial palpi very long, with the two apical joints extremely minute; antennæ black, the third joint apically, and the fourth joint, slightly reddish beneath; third joint a little longer than fourth and fifth combined, fourth much broader than long; scape with a large yellowish-white patch in front; clypeus rugose, feebly keeled in middle; labrum large, broader than long; face-markings creamy-white, as follows: lower margin of clypeus, a narrow median stripe, and broad anterior corners, a transverse supraclypeal band (broadly angulate in middle above), triangular lateral marks (filling space between clypeus and eye, nearly to top of clypeus), labrum (except narrow margin, and the usual basal spots), and basal half or more of mandibles; mandibles bidentate; malar space practically absent; mesothorax closely punctured; tegulæ light ferruginous; wings dusky; nervures piceous; legs black, with fulvous hair on outer side and black on inner, on hind tarsi all black except a small fulvous tuft at extreme base; a tuft of white hair at apex of hind tibiæ; spurs very large and long; middle tarsi normal; abdomen black with fine black pubescence, first segment with scattered red hair, conspicuous at sides, and forming a very narrow apical band; second with an apical band of red hair, broad and dense at sides, narrow and evanescent in middle; third with traces of a band at sides; apex with two widely separated short stout spines; venter black, with black hair.

♀. Looks exactly like the male; face-marks nearly the same, but scape all black, and lateral marks reduced to a stripe or band along margin of clypeus; third antennal joint slightly longer than the next three together; mandibles long and thick, strongly bent; middle tarsi with hair black, except some red on basitarsus; hind basitarsus very broad, strongly concave and shining on outer side.

Hab. Eight males and two females from Formosa (Sauter); no special locality given. A very distinct species, which may be compared with the following: *A. florea*, Sm., which differs by the ferruginous femora, and the narrow white hair-bands on abdomen; *A. proserpina*, Grib., which is more elongate, with orange face-markings; *A. insularis*, Sm., which differs at once in the coloration of the abdomen; *A. brookiæ*, Bingh., which has testaceous nervures, the clypeus with more yellow, and lighter wings. The type of *A. urens* is a male.

Cœlioxys afra sauteri, n. subsp.

♀. Length, 9 mm.; like *C. afra*, Lep., but mandibles black (the apical tooth obscurely reddish); legs and end of abdomen black; anterior border of mesothorax with a median trilobed patch of white pubescence, instead of the stripe seen in *C. afra*, and there are no patches on each side of it, as there are in *afra*; axillar teeth with the outer side straight (convex in *afra*).

Hab. Taihanroku, Formosa, "11. 6. 08." (Sauter). This should possibly be regarded as a distinct species, but it is extremely close to *C. afra*. I suppose that Friese had this form before him when he recently recorded *C. afra* from Formosa. In its entirely black apex of abdomen it resembles the larger *C. emarginata*, Foerst.

Cœlioxys rhinosus, n. sp.

♀. Length, 11 mm.; black, including the mandibles and legs; pubescence of the usual kind, white; at sides of face dense and very pale ochreous; on anterior part of mesothorax loose, not forming spots or patches; eyes strongly pubescent; front rugose, obtusely elevated in the middle; vertex with very large confluent punctures; cheeks densely covered with white hair; antennæ black; clypeus roughened but shining, strongly elevated in the middle to a keel, the side view nose-like, with a convex outline; lower margin of clypeus strongly nodulose; mandibles broad, with a long oblique cutting edge; mesothorax and scutellum very strongly and densely punctured, the latter without any smooth edge; scutellum very obtusely angulate, not dentate, in middle; axillar teeth short but evident; tubercles strongly keeled; tegulæ dark rufo-piceous; wings brown, hyaline basally; abdomen strongly punctured, with narrow dull white hair-bands, enlarged at sides; transverse grooves on second and third segments weak; last dorsal very long, strongly keeled, neither notched at sides nor turned up at end; last ventral long and narrow, sharply pointed, extending nearly half a millimetre beyond last dorsal, not at all notched at sides: under side of last ventral striated.

Hab. Formosa (no special locality given). Easily known by the peculiar clypeus. The apical structures of the abdomen are entirely of the type of *C. brevis*, Ev., and *C. rufocaudata*, Sm., except that the last dorsal is much more elongate. Compared with *C. siamensis*, Ckll., the abdomen of *C. rhinosus* is much more densely punctured, and the clypeus is entirely different.

A second paper will deal with the genus *Nomia* as represented in Formosa.

NEW SPECIES OF BOARMIINÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 316.)

Hirasa flavipicta, sp. n.

♂. Fore wings brownish black, with a purplish tinge; antemedial line represented by three yellow dots, and the postmedial line by six or seven yellow dots, the upper four more or less united; both lines followed by interrupted blackish bands; a yellow lunule at end of the cell, and a larger yellow spot on costal area before postmedial line; some yellow dots towards costa and dorsum represent the subterminal line. Hind wings brownish black with purplish tinge; medial and postmedial lines indicated by more or less connected yellow dots; a yellow spot about middle of medial line. Fringes of all the wings marked with yellow. Under side of fore wings similar to above; yellow markings of hind wings much enlarged; a black discal mark on all the wings, that on the hind wings the larger.

Expanse, 26–28 millim.

Collection number, 875.

Two male specimens from Arizan (7500 ft.), September 11th, 1906, and August 14th, 1908.

Prorhinia rantaizana, sp. n.

♂. Pale brown, inclining to whitish, powdered with darker brown. Fore wings have a conspicuous black dot at end of the cell; the ante- and postmedial lines very indistinct, faintly dotted with black; dorsal end of medial line purplish brown; subterminal line whitish, wavy, some purplish brown clouds on its inner edge. Hind wings have a purplish brown band before the black discal mark; postmedial line indistinct, dotted with black, commencing on the costa near the subterminal line, terminating on dorsum just beyond middle; subterminal line whitish, wavy, inwardly edged with purplish brown clouds. Under side whitish, finely powdered with brownish; discal spot and terminal area of fore wings purplish; discal spot and postmedial line of hind wings purplish.

♀. Rather more thickly powdered with brown; the purplish brown markings less in evidence.

Expanse, 30 millim.

Collection number, 803.

One example of each sex from Rantaizan (7500 ft.). The male captured April 16th, 1906, and the female April 24th, 1907.

Ectropis duplicata, sp. n.

♂. Pale greyish brown, freckled with darker; antemedial line of fore wings dark brown, double, straight; postmedial line dark brown, double, indented at middle; discal mark black, linear; some dark clouds on terminal area; the transverse lines of hind wings similar to those of fore wings, but the antemedial is not double; all wings have a black mark at end of the cell. Under side pale greyish brown, markings as above, but transverse lines are not double.

Expanse, 28 millim.

Collection number, 816 *a*.

One male specimen, in rather poor condition, from Karapin (3000 ft.), August 1st, 1908.

Near *indistincta*, Hampson.

Alcis decrepitata, sp. n.

♂. Pale whitish grey powdered with brownish. Antemedial line of fore wings represented by a black dot on the costa, a smaller one on the median nervure, and a dusky mark on dorsum; postmedial line dusky, wavy, indented below costa, turned inwards under the cell, thence slightly oblique to beyond middle of dorsum; medial line or shade indicated by a blackish spot on costa above the black discoidal spot, and a blackish mark about middle of dorsum; subterminal line dusky, wavy, rather broad. Hind wings have a blackish discoidal mark, and traces of a dusky antemedial line; postmedial and subterminal lines dusky, both wavy and parallel with termen, the latter line rather broad; discoidal spot blackish. Under side whitish grey, rather silky; postmedial line and discoidal spot fairly distinct.

Expanse, 58 millim.

Collection number, 195 *a*.

A slightly abraded male specimen from Kanshirei (1000 ft.), April 29th, 1908.

Allied to *B. cineracea*, Moore, from Sikkim.

Alcis divisaria, sp. n.

♂. Fore wings whitish, suffused with pale pinkish brown on basal and outer areas; antemedial line black, curved, obtusely angled above dorsum, thickened towards costa; postmedial line black, dentate, strongly angled and thickened opposite end of cell, thence incurved to dorsum, above which it is slightly angled; terminal line black, wavy; discoidal mark blackish, inconspicuous; medial area limited by transverse lines, freckled with brownish. Hind wing whitish, freckled and clouded with brownish on basal half, suffused with pinkish brown on outer half; medial line black, undulated, thickened towards dorsum; terminal line black, wavy; discoidal dot black. Under side whitish, freckled and clouded with brownish; markings as above, but less distinct, especially on the fore wings.

Expanse, 47 mm.

Collection number, 1571.

One male specimen from Arizan (7500 ft.), August 15th, 1908.

Alcis rimosaria, sp. n.

♂. Fore wings pale ochreous brown, freckled with dark grey, clouded with blackish on the outer area; antemedial line blackish, angled below costa, indistinct; postmedial line black, dentate, nearly straight; medial line dusky, indented above and below the black discoidal spot; space between medial and postmedial lines white flecked with brown; a whitish cloud at apex and another below middle of outer area; fringes checkered with dark grey, preceded by a series of black lunules. Hind wings whitish, flecked with ochreous brown and dark grey; discoidal spot and diffuse line below it blackish; postmedial line blackish, dentate, followed by a blackish shade towards dorsum; fringes whitish grey, preceded by a series of black lunules. Under side similar to above, but paler; postmedial line of hind wings indicated by dots, except towards dorsum.

Expanse, 38 millim.

Collection number, 806 *a*.

A male specimen from Arizan (7500 ft.), September 15th, 1906.

Alcis amplaria, sp. n.

♀. Greyish brown, suffused and clouded with blackish; antemedial line of fore wings black, curved, indented below costa; postmedial line black, dentate, inwardly oblique between veins 5–2, thence sinuous to dorsum, where it is thickened; discoidal mark black, linear, followed by a blackish shade-like band terminating on dorsum near the postmedial; subterminal line whitish, inwardly edged with black, indistinct towards costa. The black transverse markings on the hind wings appear to be continuations of those on the fore wings, but the postmedial is curved and more strongly dentate, and the subterminal is rather broader and inwardly shaded with blackish. Under side pale grey, rather silky; a square white spot at apex of fore wings; all the wings have a black discoidal spot and broad blackish postmedial line, the latter marked with black on the veins; hind wings have a whitish patch on termen towards costa.

Expanse, 58 millim.

Collection number, 1542.

A female specimen from Kanshirei, April 30th, 1908.

Closely resembles *A. gemmaria* from Europe, but much larger.

FOUR NEW PTEROPHORIDÆ.

By T. Bainbrigge Fletcher, R.N., F.E.S., F.Z.S.

(Published with the Sanction of the Inspector-General of Agriculture in India.)

(Continued from p. 283.)

Oxyptilus wallacei, n. s.

♀?. Exp. 15 mm. Palpi upturned, long, thin, acuminate, sickle-shaped, projecting length of head beyond it, second joint much longer than diameter of eye, third slightly shorter than second; dark reddish-brown, whitish at joints and beneath. Antennæ dark ferruginous, spotted with white. Head dark ferruginous; a few erect scales on back of vertex. Thorax ferruginous-yellow, black anteriorly and posteriorly. Abdomen long, stout, bright golden orange; some whitish-ochreous suffusion on sides at base, third segment with a transverse apical black bar across dorsal area, sixth segment blackish apically, seventh and succeeding segments blackish; a pair of long, narrow, parallel ochreous-brown anal hair-pencils. Legs bright golden orange; posterior tibia slightly dilated, with short blackish spines at one-half and apex, and emitting pairs of long blackish spurs, of which the inner are the longer; posterior tarsi lined above with black, except in middle of first tarsal joint. Fore wing rather broad, cleft from beyond two-thirds (within three-quarters), both segments slightly dilated posteriorly; first segment subparallel-sided, both angles well-marked, termen slightly oblique; second segment as broad basally as first, slightly dilated posteriorly, tornus well-marked, termen oblique, concave, anterior angle rather produced. Colour black; costa dotted with white on its middle third; patches of bright ferruginous-orange as follows: (i) a few small ill-defined basal patches; (ii) an elongate discal patch between about one-fourth and one-half, enclosing a small black spot, not reaching costa, and only reaching dorsum at base of patch; (iii) an inwardly oblique bar from costa at three-fourths, extending over basal half of first segment, around base of cleft, and into basal half of second segment, becoming obsolete towards dorsum; first segment crossed at two-thirds of its length by a narrow white inwardly oblique line parallel to termen, and with a few white dots on hinder margin on basal half of segment; second segment cut beyond one-half of its length by a narrow white inwardly oblique line. Cilia on costa black, except opposite outer orange patch and transverse line, where they are ochreous-whitish, on termen of first segment whitish, black around both angles, within cleft whitish on basal three-fifths, black on terminal two-fifths of segments, on termen of second segment whitish, black at base, very narrowly so in centre of termen, broadly so around angles, on dorsum whitish, with small black scale-teeth at beyond one-half, about two-thirds (rather within a line drawn from base of cleft), and five-sixths (exactly below transverse white line), blackish, and gradually decreasing in length between last scale-tooth and tornus. Hind wing cleft from about two-fifths and from near base, segments linear, third segment about one-half length of first; bright golden orange, first two segments blackish beyond one-fourth.

Cilia yellowish-grey, blackish-fuscous on outer half of first two segments; third segment with a small apical scale-tooth, composed of black scales, short and of uniform length on fore margin, longer basally on dorsum, and decreasing in length to tornus.

One specimen. Aru (Wallace), *ex* Stainton Collection.

In the general appearance of its fore wings this species appears to be a *Platyptilia*, but the long sickle-shaped palpi, ornamented abdomen, and linear-segmented hind wing, with a scale-tooth on fore margin of third segment, seem to bring it within the genus *Oxyptilus* as at present understood. There is no doubt that, in the near future, this and other species will have to be removed from the genus *Oxyptilus*, but until further material for study is accumulated it seems to me that no good purpose will be served in attempting to differentiate new genera.

O. wallacei will probably form the type of a new genus, which (though I cannot examine the neuration) will be somewhere intermediate between *Oxyptilus* and *Sochchora*.

Sochchora albipunctella, n. s.

♂. Exp. 15 mm. Labial palpi long, very slender, erect, smoothly scaled; second joint curved, ferruginous-brown; third joint acuminate, about two-thirds length of second, ferruginous-brown, paler at base; third joint equals diameter of eye. Antennæ ciliated, blackish-ferruginous, dotted with whitish above. Head bright ferruginous; top of crown with some erected scales. Thorax bright ferruginous, ferruginous-golden on patagia and posteriorly. Abdomen large and stout; bright ferruginous-golden, dorsal region mixed with whitish anteriorly, posteriorly ferruginous; anal tuft dark ferruginous; venter whitish. Fore leg ferruginous-golden, tibia dilated with scales at apex, last two tarsal joints blackish. Mid leg ferruginous-golden, tibia with apical tuft emitting a pair of long spurs; tarsal joints whitish, last two blackish. Hind legs broken. Fore wing rather broad, cleft from within three-fourths, segments broad, apex slightly falcate, termen on first segment concave, on second undulate; bright ferruginous-brown; base indistinctly marked with yellowish, an ochreous dorsal dot at one-fourth, an ochreous subcostal elongate spot at one-fourth, followed by an ochreous subcostal longitudinal streak, a transverse black streak opposite base of cleft at two-thirds, preceded and followed by pale ochreous suffusion continued obliquely downwards to dorsum, where it becomes whitish; first segment with an inwardly-curved whitish-ochreous line near base from costa to near hinder margin, area between this line and discal black streak irregularly suffused with pale ochreous, at two-thirds length of first segment a transverse incurved whitish-ochreous line; second segment cut at two-thirds by an inwardly-oblique whitish-ochreous line interrupted in centre. Cilia on costa blackish, with four short whitish-ochreous streaks on first segment, at apex blackish; on termen whitish-grey, black at base; within cleft whitish-grey; on dorsum whitish-grey, with slight blackish wisp at three-fifths, a narrow black wisp at four-fifths, area beyond this tinged with ochreous. Hind wing cleft from about three-fifths and one-fourth; first segment narrowly expanded posteriorly, sharply cut off terminally; second segment short, with distinct tornal angle, termen oblique, subconcave; third segment linear; pale ferruginous, first two segments blackish beyond two-thirds of wing, first segment conspicuously pure white on outer third of segment, third segment irrorated with blackish on outer third of its length. Cilia on costa blackish, on termen white, within first cleft blackish, mixed with white near base of cleft, on hinder margin of second segment greyish-white, on third segment pale ferruginous; on hinder margin of second segment blackish tufts at two-thirds (length of hinder margin of segment) and hinder angle; on third segment a small blackish apical scale-tuft on both margins, and a few blackish scales on dorsum beneath base of second cleft.

Hab. Ega (Bates). Type in British Museum Collection.

Pusa, Bengal: June 17th, 1911.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

(Published by Permission of the Trustees of the British Museum.)

(Continued from p. 314.)

At no point, perhaps, does the classification of the Coleoptera present greater difficulties than in the attempt to determine the true relationships between the various families that enter into the group Diversicornia. One of the difficulties arises no doubt from the fact that some of these families have not received their due share of attention, and that less is known about them and their life-histories than there is about many less interesting families belonging to more attractive groups. Conclusions that may be drawn from a study of the external morphology of the imagines alone are sometimes apt to b upset, or at least not completely borne out by a study of th corresponding larval forms. Certainly it is sometimes very surprising to see what great differences there are between the larvæ o certain families which otherwise would be considered to be ver nearly related. And these differences are nowhere more marke than in the case of some of the families placed in the grou Diversicornia. For this and for other reasons one is inclined t suspect that it is not a monophyletic group, but must hav evolved from common ancestors in more than one direction, an ought therefore to be capable of being split up into two or mor well-marked groups. But while admitting this, I confess t finding serious difficulties in accepting the groups propose either by Lameere or by Kolbe, or even the two groups Cantharoidea and Dascilloidea, under which we find the Diversicornia arranged in the last edition of the 'Catalogus Coleopterorum Europæ.'

Some of the groups, as, for example, Kolbe's Malacodermata, are no doubt natural ones in the sense that the families included are all more or less closely related to one another; but they cannot be regarded as family series in an equivalent sense to such family series as the Adephaga, Staphylinoidea, Heteromera, or Phytophaga.

Take Kolbe's group Trichodermata. In what relation does this stand to his group Malacodermata? So close a relationship do they show through the Malachiidæ, both in the larval state and as imagines, that it is hardly possible to doubt that they are derived directly from them. And this being the case, they ought surely, as Lameere maintains, to be included with them in the same family series. From a series thus constituted Lameere would exclude the Derodontidæ, whether rightly or not I am hardly prepared to say, though I certainly should not place this family between the Corynetidæ and Cleridæ. The doubtful origin and position of this family is one of the difficulties I find in regard to Lameere's own group Malacodermata. Two other families—the Byturidæ and Ostomidæ—placed by Kolbe and Lameere in the Clavicornia, offer resemblances of such a character to the Melyridæ and Cleridæ as to give some reason to doubt whether these resemblances are merely the result of convergence. And it was probably for some such reason that the authors of the European Catalogue place in the single series Cantharoidea most of the families which Kolbe places in his groups Malacodermata, Trichodermata, and Clavicornia. In this series also they place the Sphindidæ and Cioidæ, two of the families included in Kolbe's group Bostrichoidea. Lameere also places these two families amongst the Clavicorns, and but for this and his inclusion in it of the Derodontidæ, his group Teredilia would be equivalent to the Bostrichoidea of Kolbe.

If the doubtful families could be put aside, the Teredilia or Bostrichoidea left as a group consisting of the Lymexylonidæ, Lyctidæ, Bostrichidæ, Ptinidæ, and Anobiidæ, would be a fairly natural one, having no very evident affinity with any of the remaining families of Diversicornia. They are included amongst the Dascillidæ in the European Catalogue, altogether wrongly, I think, for it seems impossible to derive them from any but the most primitive of Diversicornia. It is almost certain that they cannot have been derived from any other of the families included in the Dascillidæ. Of the groups into which it has been proposed to split up the Diversicornia, there is none which has, in my opinion, a better claim to stand than this one of the Teredilia or Bostrichoidea.

Another group—the Sternoxia of Kolbe—would seem almost to have an equal claim to stand, but there seems to me to be much weight in Lameere's argument that the Buprestidæ cannot be derived from any of the other families which Kolbe includes in the group. Structurally they are very different, and there is also a vast difference between the larvæ of the Buprestidæ and Elateridæ—a wide gap which no intermediate forms fill up. Lameere believes it to be a diphyletic group, the Elateridæ and Buprestidæ being derived from different Dascillid ancestors. In consequence he places the Sternoxia and Dascillidæ* all in one family series, for which he retains the name Sternoxia. Kolbe, too, admits that the Sternoxia are derived from Dascillidæ, but from the non-development of coxal plates on the hind legs of the Cerophytidæ he argues that the Sternoxia could only be derived from some Dascillid ancestor in which these plates were absent—a condition met with in no existing family of the group. There would be little to distinguish that Dascillid ancestor from a Malacoderm.

For other reasons I have myself been led to the opinion that the Elateridæ and Cebrionidæ are more nearly related to the Malacoderms than they are to the Buprestidæ, or even to the Dascillidæ, from which they are supposed to be derived. To me it would seem quite as reasonable to believe that the Dascillidæ, or some at least of the families included in the group, have themselves been derived from primitive Elateroid ancestors. The larvæ of the Elateridæ are in many ways so very like those of the Malacoderms that it is difficult to say in what essential respect they differ. The wing-venation of the more primitive genera of Elateridæ is scarcely distinguishable from that of the Lampyridæ and other Malacoderms, and certainly resembles it more than it does that of any Dascillid genus which I have yet examined. The Elateridæ have, like the Malacoderms, only four Malpighian vessels, whereas it appears that the Dascillidæ, as a rule, have six, though to this rule there are exceptions, which will no doubt increase when the group has been more thoroughly investigated. In the Dascillidæ, without exception so far as I know, the scutellum and base of the elytra are more or less raised and sharply margined in front so as to fit closely and perfectly against the base of the prothorax. This co-adaptation of the parts is wanting, or at least not nearly so perfect, in the Cebrionidæ, the condition in this family being more like that of the Malacoderms. The coxal plates for covering the hind femora are, as Kolbe points out, wanting in the Cerophytidæ and are so feebly developed in some Elateridæ that there is little in that respect to distinguish them from the Malacoderms. The genus *Phenace* of Pascoe, placed by him in the Melyridæ, offers characters of such a kind that it is difficult to decide whether it is a Malacoderm or an Elaterid. The head has in front a rather sharp, slightly raised, projecting margin, beneath which what appears to be a narrow transverse epistome can just be seen; the prosternum sends back a short narrow process which is received in a small cavity or depression of the mesosternum. Both of these characters suggest an affinity with the Elateridæ, and there is nothing to conflict with this view either in the structure of the legs, including their long, simple, five-jointed tarsi, or in the shape and sculpture of the elytra, all of which have much resemblance to those of *Ceroplastus*.* But the prothorax, instead of having the posteriorly diverging sides and conspicuous hind angles so characteristic of the Elateridæ, has the sides slightly rounded in the middle, narrowed as much towards the base as to the apex, and with only a feeble trace of a sharp lateral margin. Again, there is no such co-adaptation between the base of the prothorax and the base of the elytra and scutellum as is generally met with in the Elateridæ. But this, as I have already stated, is very imperfect in the Cebrionidæ, and it is almost equally so in *Ceroplastus*. On the whole, it is most probable that *Phenace*, Pasc., is a Malacoderm, though not rightly placed in the Melyridæ. But if a Malacoderm, it seems to me to be one that with very little change might be converted into an Elaterid of a not very primitive type. By saying that I do not wish to suggest that it is a prototype of the Elateridæ. It is only to support my view that the relationship between the Elateridæ and Malacodermata is very much closer than has hitherto been suspected.

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* In the Dascillidæ, Lameere includes the Artematopidæ, Dascillidæ Lichadidæ, Rhipiceridæ, Chelonariidæ, Eucinetidæ, and Cyphonidæ.

A SECOND LIST OF THE APHIDIDÆ FOUND IN KENT.

By Fred V. Theobald, M.A., F.E.S., &c.

The following eighty-three species of Aphididæ from Kent have been definitely identified. Most of them have been taken this year. Many are new to Britain. Some dozen or so more I have been unable to fix with any degree of certainty, and at

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* *Ceroplastus*, Heyden, 1891, for some time wrongly named *Plastocerus*, is one of a group of genera, taken some from the Elateridæ and some from the Eucnemidæ, to form a family, named by Reitter Phylloceridæ, and by Schwartz Plastoceridæ. From this proposed family, as it was characterised and constituted by Schwartz, there are certain genera which ought to be excluded, and, as one of these is the genus *Plastocerus* itself, the family name can hardly stand. Reitter gives as the chief distinguishing character of the family that there is a membranous hind border to each of the first four visible segments of the abdomen, whereas in true Elateridæ and Eucnemidæ only one segment, the fourth, is so provided. But the possession of this one feature in common does not seem to be a sufficient justification for bringing together forms which otherwise are so different as *Phyllocerus* and *Ceroplastus*.

least ten marked species are new. The latter will be described later. They have nearly all been taken within a three-mile radius of Wye. This makes one hundred and sixty-four species known to the Kent fauna. A few localities outside Kent are also given. The old descriptions in several cases are quite inadequate; for instance, the descriptions of *Macrosiphum* (*Siphonophora*) *pisi* of Kaltenbach, Koch, Buckton, and others, applies equally well to the green aphis on stitchwort (*Stellaria*), on meadow-sweet (*Spiræa*), &c., but a microscopic examination shows them to be distinct species. Species, especially in the genus *Macrosiphum*, can only be identified from balsam preparations. The structure of the antennæ and the sculpturing of the cornicles, and to some extent the female genital process, are the characters of most specific value. The number and disposition of the "sensoria" on the antennæ in the alate forms is very marked in the different species, as well as the form of the segments.

In many cases I find it most difficult to place species in the described genera, and several recorded here I have left in the old genus *Aphis* pro tem. The present year has been one of the most prolific we have seen for plant-lice for a long time, but the prolonged drought destroyed so much of the vegetation they were found on that in many cases no alate forms occurred.

Genus Macrosiphum, Passerini (Siphonophora, Koch).

Macrosiphum (*Siphonophora*) *gei*, Koch.—Abundant in all stages on *Geum urbanum*, clustering on the flower-stalks, colonies often six inches long. The alate forms readily fall if shaken. Wye, Faversham, and Herne Bay, from the first week in May until August; constant winged broods appearing. Passerini places this as a synonym of *pisi*, Kaltenbach; it is quite distinct. I also found it in May at Ventnor, Isle of Wight, and in Ecclesbourne Glen, Hastings. No trace after August 10th. Schouteden considers this the same as *ulmariæ*, Sch.

M. (*S.*) *stellariæ*, Schrank.—Abundant on the lesser stitchwort (*Stellaria graminea*) in May. Like the former, readily falls if shaken. Mostly large apterous females. Wye, May 27th, 1911, fairly common in one locality; also found abundantly on May 7th, in Ecclesbourne Glen. Kaltenbach mentions *Aphis pisi* on this plant, evidently mistaking it for his species described from peas, &c.

M. (*S.*) *ulmariæ*, Schrank.—On meadow-sweet (*Spiræa ulmariæ*), in dense colonies on the young shoots, and later under the flower-heads. The adults readily fall if shaken. Alate and apterous forms in June and July. Very common, Wye, 1911.

M. (*S.*) *jaceæ* Linn.—On thistles, Wye Down, June 30th, July 11th, and October 10th, 1911, apterous females and larvæ in a dense mass beneath blossoms and down the stalks; on *Centaurea nigra*, July 11th, August 19th, and October 15th, 1911, winged and wingless females, and a few on *Centaurea cyanus*.

M. scabiosæ, Buckton.—On flower-stalks of wild and cultivated scabious. Common around Wye, June 15th and July 11th, 1911; also on *Capsella bursa-pastoris* seedheads, June 12th, 1911.

M. (*S.*) *artemisiæ*, Boyer.—On *Tanacetum vulgare* at Crundale, June 27th, 1911, and on the same from Hereford, July 24th, 1911; a few apterous females. Kaltenbach's *tanacetaria* is evidently the same.

M. (*S.*) *absinthii*, Linn.—On wormwood; Wye, July 20th, 1911, a few apterous females on a single plant growing on the Agricultural College Farm; Hereford, a number sent me by Dr. Durham, July 24th, 1911.

M. (*S.*) *alliariæ*, Koch.—A few large apterous females on thistles near the river Stour, Wye, June 7th, 1911; also on sow-thistles (*Sonchus*) and small hawkweed (*Hieracium* sp.?), a few wingless females and larvæ on each flower-head, some pink; also on *Crespis*, August 7th, all larvæ and apterous females.

M. (*S.*) *centaureæ*, Koch.—On wild knapweed (*Centaurea nigra*) on Wye Downs, in lines of ten to fifty up the flower-stalks, June 20th and July 17th, 1911.

M. (*S.*) *tussilaginis*, Koch.—On the under side of young leaves of coltsfoot (*Tussilago farfara*) at Herne Bay, July 15th, 1911, two apterous females, in company with two other aphides apparently undescribed.

M. (*S.*) *cichonii*, Koch.—Below flowers and buds of *Cichorium intybus*, Wye, July, 1911, winged viviparous females, scarce.

M. (*S.*) *hieracii*, Kaltenbach. — On a garden hawkweed, Wye Court, June 12th, 1911, in great abundance; no winged forms appeared, a few on the flower-stalks of *Hieracium umbellatum* on Wye Downs, June 20th, 1911. Has continued through until October 15th without any winged forms appearing.

M. (*S.*) *campanulæ*, Kaltenbach.—On *Campanula rotundifolia* in small numbers on the Warren, near Ashford, taken by Mr. Jemmett in July, on the flower-stalks.

M. (*S.*) *ribicola*, Kaltenbach.—On gooseberries, distorting the tender shoots in May around Wye. Caused considerable harm and must not be confused with several other gooseberry species.

M. (*S.*) *olivata*, Buckton.—On *Carduus lanceolatus*, apterous females only, Wye, July 2nd, 1911; and also from Haddenham, Cambridgeshire, June 19th, 1911.

M. (*S.*) *lathyri*, Walker?—On *Lotus corniculatus* and *Lathyrus* sp., Wye, August 3rd, 1911. Closely resembles *M. pisi*, Kaltenbach, but quite distinct, wingless females only in small numbers.

M. (*S.*) *convolvuli*, Kaltenbach.—On the large wild bindweed (*Convolvulus major*). A single apterous female at Wye, under a leaf, June 20th, 1911.

Genus MEGOURA, Buckton.

Megoura (*Siphonophora*) *viciæ*, Kaltenbach.—Wye, on broad beans in my garden with *Aphis rumicis* and *M. pisi*, June 7th, 1911. On *Vicia* and *Lathyrus*, July 4th and 10th, 1911, all wingless females; September 19th, 1911, on *L. sylvestris*, dense masses of large wingless females on the green seed pods, near Wye station. There is no doubt that Buckton's *M. viciæ* is the same as Kaltenbach's. It also answers to the same insect figured by Koch, except that in the figure the legs are all black and the wingless female has two black spots at the base of the cornicles. Buckton, however, says his *Megoura viciæ* is certainly neither Kaltenbach's nor Koch's species. This genus seems so close to Buckton's *Amphorophora* that it should probably be sunk as a synonym of it.

Genus Phorodon, Passerini.

Phorodon galeopsidis, Kaltenbach.—A few wingless females on *Polygonum aviculare*; Wye, June and July, 1911, and a winged female on October 14th.

Genus Rhopalosiphum, Koch.

Rhopalosiphum calthæ, Koch.—This marked species I found in abundance in June and July on the king-cup (*Caltha palustris*). On June 7th I first noticed a few large apterous females on the under sides of the largest leaves in a wood near the Stour at Wye. On visiting them in the following week, each female was surrounded by brownish young, as many as forty around each mother, of various sizes. These patches were always round and the insects remained close together and could not easily be removed, as they held tenaciously to the tissue. Winged females occurred on July 20th, and went on appearing until the plants under observation died. The very marked cornicles might be a sufficient character to separate this insect from the genus in which Koch placed it. In alcohol they gave a deep brown solution.

Rhopalosiphum berberidis, Kaltenbach.*—I found this species in profusion in June on a *Berberis* in my garden. They had all disappeared by August 20th. Winged and wingless females were always found together.

R. xylostei, Schrank.†—Found between Wye and Boughton on wild honeysuckle, June 6th, 1911. Evidently this species, but the cornicles are green.

Genus Sipha, Passerini.

Sipha glyceriæ, Kaltenbach.—Two colonies of apterous females on *Poa aquatica* leaves along old river, Wye, July 20th, 1911, with another unidentified species.

Genus Aphis, Linnæus.

Aphis myosotidis, Koch.—On wild forget-me-nots, Wye, June 7th, 1911. A few winged females and larvæ fixed close in young apical growth, often hidden between young leaves and blossom buds.

A. lychnidis, Linn.—On red robin (*Lychnis diurna*) at Wye, Crundale, Herne Bay, and Faversham, in June (7th to 30th). Wingless females and larvæ on top of shoots and around flowers; no trace left on August 1st; a few in July, also at Ventnor and Hastings in May. Schouteden places this in the genus *Myzus*.

A. lantanæ, Koch.‡—Wye, June; curling leaves on apices of shoots of *Viburnum lantana*, dense masses of wingless females and larvæ. Another species found with it, but not yet identified.

A. umbellatarum, Koch.—At Wye, Kennington, and Crundale,

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* Walker placed this in the genus *Liosomaphis*, Wlk., but if the genus *Rhopalosiphum* is to stand, I see no reason to change its name.

† Kirkaldy, 1904, places *xylostei*, Schrank, under the genus *Hyadaphis*, which Schouteden has adopted.

‡ Mordwilko (1908) places this in his genus *Chaitophoroides*. It appears to me to be a typical *Aphis*.

June 3rd to 10th, and July 12th. Winged females and larvæ on various umbelliferæ. On *Œnanthe crocata*, June 6th, 1911, winged and wingless females; on *Heracleum spondylium*, July 11th, 1911. Schouteden places this as a synonym of *A. pastinaceæ*, Linn. The two species seem to me very distinct.

A. evonymi, Fabricius.—Wye and Broughton, on spindle (*Euonymus europæus*). Small colonies of alate forms under the leaves, producing leaf-curling, June 6th and 9th, 1911. Schouteden places this as a synonym of *A. rumicis*, Linn. It appears to me to be quite distinct.

A. abietana, Wlk.—On spruce at Wye in May and June, both on the shoots and needles. Winged females occurred in June. Common in my garden with an unidentified *Lachnus*. Also from Worksop, May 18th, 1911.

A mahaleb, Koch.—Wye, on plums of all kinds, a few wingless females from April to May 20th, on young shoots and beneath leaves, not common; also sent me from Worcestershire; quite a distinct species, and in no way connected with *Phorodon humuli*.

A. ephilobii, Koch.—On the small willow herb (*Ephilobium parviflorum*), a few scattered wingless females in June at Wye, 1911. Winged and wingless females on *Epilobium hirsutum* on October 12th, 1911.

A. rhei, Koch?—I place this here provisionally, as I have not made a critical examination of the insects. Occurred at Wye in dense masses, bleaching the flower heads of rhubarb all through June. It bears a strong resemblance to *A. papaveris*.

A. capsellæ, Kaltenbach (non Koch).—On seed heads of shepherd's purse, Wye, June 13th, 1911. All wingless females, not common. Winged females occurred on the seed-heads in October in some numbers, and produced living young. Koch's species I have not found; it is distinct from Kaltenbach's.

A. lythri, Schrank.—On purple loosestrife (*Lythrum salicarium*) amongst the flower heads, Wye, July 5th to 20th, 1911. Apparently uncommon, all wingless females.

A. chenopodii, Schrank.—On mangolds, Herne Bay, July 12th, 1911, under the curled leaves with *A. papaveris*, Fab., *A. atriplicis*, Linn. and a new species. Schouteden places this species as a synonym of *atriplicis*, Linn. It is distinct, and produces a very different appearance of the leaves.

A. genistæ, Kaltenbach.*—The Warren, Ashford, densely coating the seed pods and flower stalks of the broom (*Cytisus scoparius*). Possibly the same as *A. laburni*.

A. laburni, Kaltenbach.—On seed pods of laburnum, Wye, June 27th, 1911; Canterbury, June 19th, 1911; Maidstone, Faversham, July 16th, 1911. Also sent me from Hereford by Mr. Durham.

A. picridis, Fabricius?—Fairly abundant in apterous form for two weeks on a garden hawkweed (*Hieracium*, sp.), and a few on wild chicory (*Chiconium intybus*), Wye, July 4th, 1911. Schouteden places Fabricius's species in *Macrosiphum*, so my specimens must belong to some other species. Although the siphons are long, they are not like a true *Macrosiphum*, and I fancy my identification is correct.

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* Del Guercio, 1907, places this in his genus *Uraphis*. It seems to present no marked differences from others of the genus *Aphis*

A. salicti, Kaltenbach.—On osiers, Wye, June 3rd, 1911. Wingless females and a few winged, partly on young wood, some on the leaves. Its generic position is not certain.

(To be continued.)

INSECTS TAKEN BY DR. T. A. CHAPMAN IN SWITZERLAND, 1911.

By W. J. Lucas, B.A., F.E.S.

Orthoptera.

**Anechura bipunctata* (a common earwig in the Alps); one female, Pontresina,† July.

Plecoptera. (Pontresina, July.)

**Dictyopteryx alpina*, male and female.
**Chloroperla rivulorum*, male.
**Isopteryx montana*, female.
**Tæniopteryx neglecta*, female.
**Nemoura obtusa*, male and female. (It has been taken by Standfuss and Morton at Silvaplana, and by Ris at the Albula.)

Ephemeroptera. (Pontresina, July.)

Baëtis sp., a female imago.
**Ecdyurus helveticus*, a male imago.

Odonata (= Paraneuroptera).

**Somatochlora alpestris*, one male, Pontresina, July.
Æschna juncea, one male, Lintthal,† end of June.
Agrion hastulatum, two males, end of July, of which Dr. Chapman says: They "were common at Statzer See (6000 ft.) by St. Moritz. I could easily have taken a dozen or two. It was the only dragonfly at all common, or easy of capture."

Neuroptera.

**Panorpa alpina*, one female, Lintthal, end of June.
**P. vulgaris*, one male, Pontresina, July.
Sialis lutaria, three, Pontresina, July.

Trichoptera. (Pontresina, July.)

Phryganea obsoleta, four males.
Limnophilus rhombicus, one female.
L. flavicornis, one male (the fine alpine form, also taken by Standfuss at Silvaplana).
**Drusus chrysotus*, male and female.
**D. discolor*, female.
Stenophylax alpestris, male.
**Lithax niger*, three males.
Mystacides azurea, male and female.

Those insects whose names are preceded by an asterisk (*) do not belong to the British fauna.

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† Pontresina means also St. Moritz and district around—6000–8000 ft. Lintthal means that valley and upwards—4000 ft.

Kingston-on-Thames: October, 1911.

LEPIDOPTERA OF THE SWEDISH PROVINCES OF JEMTLAND AND LAPLAND.

By W. G. Sheldon, F.E.S.

Scandinavia has hitherto received but little attention from our British lepidopterists; there are good reasons for this, for, although according to Lampa's list Sweden and Norway together hold one hundred and eight species of Rhopalocera—including a round dozen which are not found elsewhere in Europe, except in Russia, and about half as many more than can perhaps be found with certainty and easier there than elsewhere—the experience of past explorers has not been altogether successful, and I am not sanguine that anything I can say on the subject is likely to send my brethren of the net swarming thitherward.

The distances to be traversed (my journeyings involved travelling about five thousand miles); the comparative inaccessibility of some of the reputed best localities; the uncertainty of the weather, which not infrequently compels one to be a week or more without the sight of a wing; and the little knowledge that exists of the exact time at which a species is to be found in a locality, with the variation of dates of emergence in different places and seasons, are amongst the difficulties one has to contend with.

I had, in view of these and other obstacles, been making enquiries, as exhaustive as possible, during the past winter, with a view to an itinerary that offered the best chances of success with the butterflies of the region; and I would like here to take the opportunity of returning my best thanks for the very valuable information given fully and freely by all to whom I applied; my thanks are especially due to my friends Messrs. H. Rowland-Brown and A. H. Jones, to Herr Max Bartel of Berlin, and to Pastor Pfitzner of Sprottau (both of whom have recently visited Lapland), and to Herr Spane Schneider of Trömsö, to whose assistance is largely due any success that I achieved.

The only articles on Scandinavian Lepidoptera I can find in the English magazines are the following:—

(1) "Notes on some Lepidoptera Captured in Norway," by R. C. R. Jordan, M.D., Ent. Mo. Mag. xxv. p. 139.

(2) "Notes on the Coleoptera and Lepidoptera (Rhopalocera) of Norway," by G. C. Champion, F.Z.S., Ent. Mo. Mag. xxvi. p. 72.

(3) "Butterflies in South and North Norway," by T. A. Chapman, M.D., F.E.S., Ent. Mo. Mag. xxxv. p. 20.

(4) "Lepidoptera in the Neighbourhood of Roldal, Norway," by the Rev. F. A. Walker, D.D., F.E.S., 'Entomologist,' xxv. p. 36.

(5) "Among the Butterflies and Flowers of Norway," by R. S. Standen, F.L.S., F.E.S., 'Entomologist,' xxxi. p. 193.

(6) "Some Notes on Scandinavian and Lapland Butterflies," by H. Rowland-Brown, M.A., F.E.S., 'Entomologist,' xxxix. p. 220.

(7) "Notes on a Small Collection of Lepidoptera made by Dr. T. A. Chapman in Lapland," by J. W. Tutt, F.E.S., Ent. Record, viii. p. 289, and observations thereon, by W. E. Nicholson, F.E.S. (*ibid.*), p. 294.

It will be noted that all these articles, except Mr. Rowland-Brown's, deal with Norway only, and possibly this was one of the reasons that decided me to confine my attention entirely to Swedish territory; there were others, however, that had their influence, among them being the difficulty experienced in Norway, that in consequence of the proximity of the Gulf Stream butterflies emerge in the Arctic Regions at practically the same dates that they do in the South; one cannot therefore with advantage collect in both these areas in one season.

In Sweden the arctic portions are much colder, and thus in this country one can occupy the first half of June with the south and then proceed by train, a two days' journey, to the north, to find the season of emergence just commencing there. Then, again, the rainfall of Sweden is much less than that of Norway, and this seemed to promise a greater chance of sunshine, and consequent better opportunities of observing and collecting, and probably greater abundance of specimens than were likely to be found in the sister country.

It is the usual experience in discussing Scandinavia with those of our acquaintance who have visited it, and who have any knowledge of Lepidoptera, to be told that the only butterflies they have seen there were the species common in all countries, such as red admirals, tortoiseshells, orange-tips, &c.; this is no doubt a fact, and it is accountable on the supposition that the relators did not search in the proper places. Nowhere in Europe, I suppose, are the special butterflies of a country more local than in Sweden, and presumably in Norway also.

Until the dawn of civilization a few hundred years ago, the whole country up to the tree limit, was covered entirely by forests of birch, spruce, and pine, and swamps; a great portion—probably three-fourths of the area or even more—is still in practically primeval condition.

These forests are usually so thick as to preclude the growth of the plants butterfly larvæ feed upon, and thus you may wander in them for hours without seeing a butterfly, or for a week without being able to net one you would care to take home.

In the swamps, which are in area but a small percentage of the entire country, the case is different; it does not seem to matter much whether a swamp is hidden away in the depths of some great forest, where a hollow has held the moisture for ages, or if it is in the slope of a mountain, where a stream-let, born at the tail of a perennial snowdrift, in its progress towards the bottom has lost itself and thereby caused some boggy place. Here are to be found, often in abundance, the plants that are necessary to the existence of the Lepidoptera, and here, with few exceptions, we may expect to see the special butterflies that are the object of our search. They are not usually very abundant, for, with the exception of a few species, we may collect hard all day and get perhaps a dozen examples of what we want; but these will repay, by their beauty, their rarity, and their interest, the trouble taken in procuring them.

I left England on the evening of May 31st last, and travelling overland, *viâ* Sassnitz and Trelleborg, reached Stockholm on that of June 2nd. Here, amongst other events, I visited the Natural History Museum, and called upon the veteran Scandinavian lepidopterist, Professor Aurivillius, who received me most kindly, and courteously showed me the national collection of Swedish Lepidoptera.

Leaving Stockholm on the evening of June 3rd, I arrived at Mattmar, at the north-west corner of Lade Storsjö, in Jemtland, about noon the next day. The attraction for me at Mattmar was the very fine bog which exists there, and which is now unfortunately, from the lepidopterist's point of view, being drained. This swamp is covered with a growth of crowberry, cotton-grass, bog-bean, cloud-berry, lichens, moss, and dwarf birch and sallow, amongst which various charming flowers, including *Andromeda polifolia*, is abundant. Here and there in the drier parts straggling larches and pines maintain a precarious existence, the rising ground around the swamp being thickly covered with spruce and pine, with groves of birches in places.

I found at Mattmar a small hotel or inn, very clean and inexpensive, and the good people most obliging and anxious to do their best. After partaking of lunch and unpacking, I made for the swamp under the guidance of a friendly native, who spoke a little English, and who had, with the kindliness and courtesy which I found everywhere in Sweden, offered to pilot me round. The day was sunny, and although it was late in the afternoon, I soon obtained examples of *Brenthis freija*, *B. frigga*, *B. aphirape* var. *ossianus*, *Chrysophanus amphidamas* var. *obscura*, which was abundant, and *Brenthis euphrosyne*.

The next day I annexed, in addition to further examples of the foregoing, specimens of *Erebia embla* and *Œneis jutta*, one only of each, unfortunately.

June 6th was unfavourable, and collecting was not possible; the next day, however, there were bursts of sunshine, and I obtained a fair number of specimens, including an example of *Hesperia centauriæ*; but was my last success at Mattmar, for the weather broke up entirely on June 8th, with snowstorms and arctic temperature. On June 9th I left for Åre, where there is a large hotel, to await developments; unfortunately, here the weather got still worse, and for several day the sun was not visible, and there were blinding snowstorms each day at intervals. But on the 13th the sun did break out for a few moments, and happening just then to be down by the side of the lake, I found *Erebia lappona* beginning to appear in abundance, but by the time I had procured my net the sun had retired, and so had the butterflies, and I only succeeded, under these conditions, in kicking up three specimens. On June 14th the weather was worse than ever, and I began to wonder what it was like further north. Accordingly I rang up on the telephone the 'Turist Station' Hotel at Abisko, in Lapland, seven hundred and fifty miles distant, and ascertained that the weather was fine there, and that the season was considered an early one. This being the case, I decided I would give up further hopes of Jemtland.

It was very disappointing not to see certain of the butterflies of this province, which I believe has a rich lepidopterous fauna, and which information I received had led me to expect, but my experience confirmed the essential lesson one must learn with respect to the butterflies of Scandinavia, that it is of not the slightest use going to a district for a few days or a week. If one wants success, it is necessary to be on the ground immediately the species we require emerge, and to remain there until our object is achieved; which will usually mean a sojourn of several weeks.

On the afternoon of June 14th, I left Åre, bound for Abisko. The Lapland express had not then commenced to run, but by spending a night at each of the excellent railway hotels of Bracke and Boden, travelling by the ordinary train, I reached Abisko quite comfortably on the evening of June 16th.

Abisko has gone ahead since the days when Mr. Rowland-Brown visited it in 1906, not in all respects to the advantage of the naturalist. The hotel has been enlarged to an extent that, with its "dependences," it will accommodate near on two hundred guests; and it is usually crowded after July 1st. A station has been built just outside the hotel and named Abisko-jokk, to which one should take one's railway ticket in preference to the station of Abisko, two kilometres further east. The Torne Träske is now served by a motor-launch, from which I hoped great things, for I was informed that by it I could easily reach the rich localities which undoubtedly exist on the north side of the lake. But I found that this launch was taken up, practically every day, in making excursions to the Lapp camp at the head of the lake, and as it only stayed there an hour or so, and there being no good ground near by, these trips were of not the slightest assistance to me. On one occasion, on July 7th, an excursion was made in the launch to the east end of the lake, and Herr and Fraulein Sprögerts, two German entomologists staying at Abisko, and myself made arrangements with the captain to land us at Ortojokk—a place north-east of Abisko, where I had been informed good ground was to be found—on his journey out, and to call for us on his return. We managed to put in a few hours there, but we did not see the particular object of our search, *Colias hecla*, and except that *Œneis norna* was flying commonly during the few minutes sun that was vouchsafed to us, the expedition was unfruitful.

There is one place on the north side of the Torne Träske, called Jebrenjokk, just opposite to Abiskojokk, where there is a tourist hut, and here, in July, I had hoped to spend several days; but, unfortunately, the weather, when I wished to go, was impossible. I should say that this hut is not favourably situated for obtaining Lepidoptera, for practically all the likely-looking ground to be seen from the lake is separated from it by a jokk, as a brook is called in Lapland. Incidentally, these jokks are usually unfordable torrents, almost entirely waterfall or rapid, and there are other jokks near by which would greatly restrict one's possible collecting-ground; I fancy, however, by working north amongst the mountains from the hut, given fine settled weather, some good collecting might be done.

Certain enterprising individuals of the professional class are credited with having taken away plants and insects from Abisko in the past few years for the purpose of converting into money. I heard of a dealer having rooted up in one season fifteen thousand plants, and of another who slaughtered twenty-five thousand insects. I cannot say that it would be impossible to convey away that number of plants, though I doubt if it was ever done; but with respect to the insects, in five weeks, working as hard as I could, I managed to amass a total of about two hundred and fifty butterflies, and I have not the slightest doubt but that it would be impossible for a collector to get together in a single season a tenth part of the twenty-five thousand if he collected all orders, unless, indeed, mosquitoes were included. One must therefore come to the conclusion that these reports are grossly exaggerated. The effect of them, however, has been for the Swedish Government to step in, and by statute make the district round the 'Turist Hotel' at Abisko "a national park," within the confines of which "Nature must not be interfered with." This track of country has a frontage along the shores of the lake of about six kilometres, and a respectable hinterland of, approximately, seventeen kilometres, and although the boundaries have not yet been fixed, there are maps of "the park" in every public room in the hotel, and a notice in each bedroom that any person infringing the law is liable to a fine of from five to one thousand kronas (eighteen kronas equal one sovereign); furthermore, anyone can prosecute, and as the prosecutor secures two-thirds of the fine mulcted from the unlucky offender, it will be understood that visitors are not likely to sin against the statute, or incidentally naturalists to visit Abisko, in the future.

(To be continued.)

NOTES AND OBSERVATIONS.

HETERUSIA TAIWANA, NOM. NOV. *Heterusia formosana*, Wileman, Entom. xliii. p. 179, June 1st, 1910.—As the name *formosana* is preoccupied in genus *Heterusia* by *Heterusia ædea formosana*, Jordan, subspecies of *ædea*, Linn. (See Seitz's 'Macrolepidoptera of the World,' vol. ii. Fauna Indo-Austral. 4th part = Exotica, part ix. p. 34, April 18th, 1908), I have renamed this Formosan species (which is allied to *Heterusia tricolor*, Hope) *Heterusia taiwana*.—A. E. WILEMAN.

EURIPUS FULGURALIS, Matsumura.—The type of this Formosan species, which is in the Taihoku Museum, North Formosa (*nec* Taiho ku) was described for the first time by me in the 'Entomologist,' xliv. p. 263, August, 1911. By error the description was headed, "*Euripus fulguralis*, Matsumura." This heading should read, "*Euripus fulguralis*, sp. nov.—A. E. WILEMAN.

OVIPOSITING OF SESIA APIFORMIS.—In confinement this species lays its eggs freely and loosely in a chip box, and I have often wondered how it disposes of them in a state of nature, as I have searched in vain for them on and about growing trees in which they bred. One morning early, in last July, my attention was called to a female at rest at the base of a large balsam poplar in my garden, and on watching it, I found it was engaged in laying, dropping its eggs loosely on the ground. It continued to do this for a long time and laid many eggs; and when it took to flight it examined other trees in the garden, and finding they were not poplars, flew away. Whether it invariably lays in this way, I do not know, and I think it unsafe to deduce a general rule from a single instance, but I may possibly have overlooked other records of similar observations which would tend to establish the rule.—W. H. HARWOOD; Colchester.

CORCYRA (MELISSOBLAPTES) CEPHALONICA AT COLCHESTER.—On September 24th, 1910, my son on returning home from a collecting expedition noticed a little moth which he could not make out, flying outside a warehouse here. It proved to be *C. cephalonica*, and in the course of the next few days we took a good series. They were mostly at rest, some were paired, and others flying freely in the late afternoon sunshine. We had never seen the species before, and are not likely to see it again about the same warehouse, which has since been thoroughly cleared out and is now used for an entirely different purpose; while the adjacent warehouses, where the moth also occurs to some extent, have been demolished altogether.—W. H. HARWOOD; Colchester.

PYRAMEIS ATALANTA, ab.—On August 25th last I bred from larvæ collected locally a beautiful aberration of *P. atalanta*. This insect has the usually bright red on all four wings replaced by pale cream colour. Are there any previous records of a similar variety of this species?—ALFRED WM. LYNN; 37, Rodsley Avenue, Gateshead.

MELANIC EMATURGA ATOMARIA AT BURNLEY.—On May 27th, 1911, on the moors near Burnley, *E. atomaria* were flying freely in the sunshine, and for the first time I took three or four of the dark unicolorous males, as well as some intermediate forms.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

MELANIC EMATURGA ATOMARIA AT OXSHOTT.—I took a very dark male of the var. *unicolorata* here on May 11th.—H. WORSLEY WOOD.

TERATOLOGICAL SPECIMEN OF NOCTUA C-NIGRUM.—On August 11th I took at sugar on the Isle of Wight a curious form of *N. c-nigrum.* The only markings to be observed on the fore wings are the blackish marks on the costa and the narrow triangular patch just before the costal end of the subterminal line. The whole of the fore wings from the base almost to the subterminal line and from the costa to the hind margin are sub-diaphanous. The scaling is perfect, but the pigment is missing. The insect is perfectly formed.—E. EVERETT WARRIER; 6, Lytcott Grove, East Dulwich, S.E.

MACARIA LITURATA ab. NIGROFULVATA AT OXSHOTT.—Mr. D. F. Maitland, when collecting with me in this locality on July 7th, captured a fine female of the above variety.—H. WORSLEY WOOD; 31, Agate Road, W.

LIMENITIS SIBYLLA IN SEPTEMBER.—On the morning of September 18th I saw, to my great surprise, a female *sibylla* skimming across a high road between Colchester and Ardleigh; and on returning home in a different direction later in the day, noticed a second specimen flying over the railway and settling on some moist ground beside the metals. The species was fairly common in this district at the usual time of its appearance, when a good example of the black variety was taken; but I am at a loss to account for the late appearance of these two. Could they possibly be representatives of a partial second brood, or had they æstivated during the tropical heat of July and August and left their retreat when temperate conditions again prevailed? Both specimens were apparently full of life and vigour, and went through their customary evolutions as though it were a midsummer day, for which indeed they might very well have mistaken it.—W. H. HARWOOD; 94, Station Road, Colchester.

In reference to the note on a second brood of *L. sibylla* by Mr. Gervase E. Mathew in the 'Entomologist' for this month, I may state that in 1891 I had larvæ of this species, all of which duly hybernated, except three. These fed up rapidly and produced perfect insects in September of that year.—A. B. FARN; October 7th, 1911.

CYANIRIS ARGIOLUS.—The spring brood of *C. argiolus* was four days earlier in my garden this year than last. The first noticed was on May 16th, a warm and beautiful day. I have seen and heard of nine of the autumnal brood here this season—JOSEPH ANDERSON; Chichester.

Butterflies in a Garden at Chichester.—On September 11th last several *Vanessa io* and *urticæ*, *Pyrameis atalanta*, and *P. cardui*, were flying over and settling upon the flowers in the garden here.—Joseph Anderson; Alre Villa, Chichester.

Butterflies in October.—At the present time a third brood of *Pararge megæra* is out, and also a second brood of *Satyrus semele*. Up to October 3rd I noticed specimens of a third brood of *Pieris brassicæ*; is not this very late?—J. W. Muirhead; 31, Fairhaven Road, St. Anne's-on-the Sea, Lancashire, October 18th, 1911.

Pararge megæra.—A third brood of *P. megæra* began to appear about the middle of September and has been common in all directions hereabouts; it is still well in evidence, though time is telling upon it.—W. H. Harwood; Colchester, October 10th, 1911.

Chrysophanus phlæas.—This species seemed to be quite common near Bedford on October 1st.—W. J. Lucas; Kingston-on-Thames.

This species has been unusually abundant here this autumn.—H. M. Edelsten; Forty Hill, Enfield.

Chrysopanus phlæas in the City.—Whilst I was crossing London Bridge on the afternoon of September 23rd, a specimen of *C. phlæas* settled on my arm. This seems rather an unusual insect to meet with in the City of London.—F. H. Stallman; 6, Maley Avenue, West Norwood, September 25th, 1911.

Chrysophanus phlæas Varieties.—The third brood of this species was out during the last week in August; some specimens look quite fresh yet, and I have one good-sized larva still feeding. I have examined many hundreds of wild specimens, and to my surprise have seen none of the var. *cæruleopuncta*, St. amongst them. Among those I bred were some brilliant examples of this form. I have also captured several nice varieties, including two similar to those figured in South's 'Butterflies of the British Isles,' plate 101, figs. 11 and 12. The variety recorded (*antea*, p. 320), which I saw on *Inula* but failed to capture, was a somewhat suffused example of var. *schmidtii*, and not var. *eleus*, which through some inadvertence is given as its name.—W. H. Harwood; Colchester.

Limenitis sibylla: a Second Brood.—With regard to Mr. Gervase Mathew's very interesting note (*antea*, p. 327) upon a second emergence of the White Admiral in Essex, and his remark that "it does not appear to be double-brooded on the Continent. . . ." I find that (Les Premiers Etats des Lépid. Francais, p. 150, St. Dizier, 1906) Professor Frionnet gives as the season of emergence June to July, *sometimes August to September*. M. Dupont (Cat. des Lépid. des Environs de Pont-de-l'Arche) writes as follows: "Twice in the forest of Bord I have taken this species quite fresh in September; one example, Sept. 11th, 1898, another Sept. 23rd, 1900. Is there a partial second generation in warm and dry years?" And it is, no doubt, on the excellent authority of M. Dupont, coupled with that of M. Alfred Giard, who observed isolated examples in September (1902?) near Valenciennes, that M. Frionnet relies; unless we are to understand that a second brood has been observed in his own Department of Haute-Marne.

In the hot Departments of the Midi *sibylla* apparently does not exist: at all events it is not included in my published lists for the Alpes Maritimes (Riviera), Var. Pyrénées-Orientales, &c. But it is common in the plains of the Basses-Pyrénées, where a partial second brood might be expected even in normal summers. *L. camilla* is, of course, invariably double-brooded in the south of France, but towards its northern limits, it seems, there is only one emergence. For example, M. Charles Oberthür reports (Lépid. Comparée, fasc. iii. p. 185) on the forest of Rennes, Ille-et-Vilaine: "With us we find it there from the beginning of June on into August," and at Blois M. Chevillon mentions one brood only (Bull. Soc. Hist. Nat. Loir-et-Cher, 1884).—H. ROWLAND-BROWN; Harrow-Weald, October 7th, 1911.

PHRYXUS (DEILEPHILA) LIVORNICA IN THE NEW FOREST.—On August 28th I was shown a very fine specimen of *P.* (*D.*) *livornica* which had been found at rest on a garden fence in Brockenhurst on the 23rd. The lateness of the date and the perfect condition of the insect point to its having been bred in the neighbourhood.—G. T. LYLE.

PHRYXUS LIVORNICA IN SURREY.—I captured a specimen of *P. livornica* flying over a head of *Phlox* in my garden here on August 3rd last.—E. C. JOY; Eversley, Dale Road, Purley.

PAPILIO MACHAON IN HERTS.—A single specimen of *P. machaon* was caught in June this year at Bishop's Stortford, more than thirty miles from Wicken. It is, of course, not at all unusual to see them in Norfolk villages a mile or two from their food-plant, but this year they evidently wandered to a most unusual extent.—C. MELLOWS; Bootham School, York.

PAPILIO MACHAON IN MIDDLESEX.—On August 17th my wife captured a very large female specimen of *P. machaon* in the garden here. It came down to a bed of geraniums. I cannot trace anyone having let one out in this neighbourhood.—H. M. EDELSTEN; Forty Hill, Enfield.

PAPILIO MACHAON AND SPHINX CONVOLVULI IN ESSEX.—In view of Mr. Harwood's record of *P. machaon* in Colchester, I am induced to mention that two specimens of this insect were seen during the summer in this village, which is ten miles from Colchester. I had hesitated to place these on record, as I fancied they must have been "escapes," but it now seems probable there was a partial migration of the insect. At any rate, I know of no collector nearer here than Mr. Harwood himself. I may also record the capture of three *S. convolvuli* in my garden here in August.—PERCY C. REID; Feering Bury, Kelvedon.

THIRD BROOD OF NOTODONTA ZICZAC.—It may be of interest to record a third brood of *N. ziczac*. The first imagos emerged during the last week in April, the second brood during the first week in July, and of two dozen pupæ obtained from the second brood two perfect insects emerged on August 26th and 30th respectively. The young larvæ from the second brood were kindly sent to me by Miss Edwards of East Grinstead.—R. T. BAUMANN; Glendale, Chingford, Essex, October 25th, 1911.

Second brood of Eurois prasina (Aplecta herbida).—Probably due to the abnormally hot summer a second brood of *A. herbida* has been emerging since September. The perfect insects I have found in the larvæ cage, containing at present half size and nearly full-fed larvæ, so that I anticipate further emergences. The dates of emergences are September 18th and October 1st, 2nd, 5th, 8th, and 18th. The young larvæ were kindly given to me by Mr. Hugh Main, and originate from Eastbourne.—R. T. Baumann.

Tortrix pronubana at Westcliff-on-Sea, Essex.—The above Tortrix has appeared here: I met with its larva when walking in this district one day in mid-August. In passing a privet hedge I noticed two or three of the leaves on the top of the hedge fastened together, and on examining them I found what I thought were Tortrix larvæ. As I could not call to mind any Tortrix larva that would be feeding on privet at this time of the year, I thought they might be something out of the common, so I searched further on following days and found altogether about twenty larvæ and pupæ. The first insect was bred on September 9th, others following on succeeding days. I had never previously seen the moth either alive or in any British collection, so for a time I assumed it was possibly a new species to this country, and that I was the fortunate discoverer. My dream was, however, soon dispelled, as on looking through the back numbers of the 'Entomologist,' I came across Mr. Adkin's very interesting article (*vide* 'Entomologist,' vol. xxxix, p. 265) on his finding *T. pronubana* at Eastbourne, and after reading same and his full description of the imago, I found that my captures were referable to this species. As I have not seen any mention of the previous capture of *T. pronubana* in Essex, this may be the first record for the county. I have now (September 20th) found this insect in three separate places in Westcliff, but they are of small extent, two of them being private gardens. In one locality, three larvæ and one imago occurred on *Euonymus*; in the other localities privet was the food of the larva.—G. H. Conquest; 10, Meteor Road, Westcliff-on-Sea.

Leucania unipuncta (Haworth) extranea (Guenée) in Devonshire.—On September 20th I was fortunate in taking a fine female specimen of this insect at sugar on the Devonshire coast. Ova were not obtained, although the moth was not killed for two days. The species appears to be very sluggish when boxed and to show but little inclination to move, although on the "sugar" it was by no means easy to capture.—(Dr.) Beckwith Whitehouse; 52, Newhall Street, Birmingham.

Caradrina exigua in Devonshire.—Between September 11th and 28th I took five fine examples of this insect at sugar. With one exception all were captured between ten and eleven o'clock and after a heavy fall of rain. It appeared probable that the latter had driven this rather sluggish insect from its resting places in the long tufts of grass. Ova were obtained from a female captured on September 11th, and the larvæ hatched between the 20th and 22nd. At the time of writing (October 9th) they are in the third "instar," and feeding rapidly upon dock. Previous to the second moult, the larvæ are distinctly gregarious, and an interesting point in this connection was noted. Two batches of ova hatched on different days, but all the larvæ were placed in the same small box. Although this mixing had taken place, at the end of twelve hours, two distinct colonies were formed; and this arrangement was maintained until the second moult was completed. A few days elapsed between the corresponding moult of each colony, indicating the different ages of the same. The colony was always formed on the under surface of the leaf, and care was taken by the larvæ to devour the parenchyma but to avoid the production of holes in the pabulum. In the third instar the larvæ tend to wander further afield and to seek solitary shelter in the curled edges of a leaf. At night they issue further and travel rapidly over the leaves, but always return to the under surface or rolled margins by day. — (Dr.) BECKWITH WHITEHOUSE; 52, Newhall Street, Birmingham.

CYANIRIS ARGIOLUS AND L. ARION.—A short time ago small black marks were noticed on some unexpanded ivy buds. On examination these marks proved to be small circular holes, varying from about $\frac{1}{32}$ in. to $\frac{1}{16}$ in. in diameter, the whole of the interior of each bud having been cleaned out. On searching the bush at night (about 8), eight larvæ of *C. argiolus* were found feeding upon the flower-buds, the small heads and necks of the larvæ being thrust through an astonishingly small hole. During the daytime no larvæ could be found by the closest searching. On beating the bush into a tray at 9 p.m., however, about twenty larvæ were taken, varying in length when at rest from $\frac{3}{16}$ in. to $\frac{5}{16}$ in. Is this larva exclusively a night feeder? Since the foregoing notes were written, one *C. argiolus* larva has eaten two other larvæ and four pupæ, nothing but the shells of the latter being left. There were originally seven larvæ in a roomy glass-bottomed pill-box, and they were well supplied with ivy flower-buds; these buds had, however, apparently been neglected. Does the larva of *L. arion* during any stage feed upon the larvæ of *Formica rufa*?—G. B. KERSHAW.

RARE COLEOPTERA AT HINDHEAD, SURREY.—I should like to record having taken at Hindhead, amongst other rare beetles, *Onthophagus taurus* and *Monochammus sutor*.—A. RICHARDS; c/o Lady Agatha Russell, Rozeldene, Hindhead, Haslemere.

LAMPIDES BŒTICUS IN GUERNSEY.—As I write (September 19th), *L. bœticus* is still disporting itself in view of my window. There has been a considerable number of this species with us since the beginning of the month. On August 11th I first saw some worn specimens of an earlier brood, probably immigrants, including females, flying round a bush of *Colletia arborescens*, close to my study window. I was therefore on the look-out for a September display, and have not been disappointed. Though not so common as in the year 1899, it seems to have bred very extensively in the island; I have taken some forty specimens in my garden, and could have easily taken as many more. I placed two females in a muslin cage, with food-plant, and have got a fair supply of eggs, but hardly expect that I shall bring them to a successful issue at this late time of the year.—F. E. LOWE; S. Stephen's, Guernsey.

Notes on Lepidoptera in Various Localities.—I was at Lyndhurst during the second fortnight in July. My experience in that fine locality was similar to that of other observers in different parts of the country. Sugar failed to attract, and there was an abundance of honeydews. I had the pleasure of seeing *Apatura iris* flying high over the Rhinefield Walk. I had also the satisfaction of seeing *Aciptilia paludum* on some bog-land near Whitley Wood, and was able to take it freely, so freely that once or twice I had half a dozen examples in my net at the same time. The time of flight appears to be from 6 until about 7.15 p.m. *Catocala promissa*, just emerged, was found on an oak-trunk at Queen Bower. *Argynnis paphia* (male) was pretty well over, and fair specimens of the female were difficult to obtain. Of var. *valesina*, I got one only in fair cabinet condition. *Limenitis sibylla* was about, but much battered. A nice melanic *Cleora glabraria* was found, and the following: *Zygæna trifolii*, *Lithosia helveola*, *Gnophria quadra*, *Cænobia rufa*, *Hypnodes costæstrigalis*, *Selenia tetralunaria*, *Cleora lichenaria*, *Tortrix cratægana*, *Peronea sponsana*, and *Phoxopteryx inornatana*. I also found a few larvæ of *Notodonta trimacula* and *Cidaria siterata*; also one full-fed larva of *Sphinx ligustri* crossing a forest-path. I spent a week at Tenby in early August in very unsettled weather and explored the pine-woods near Scotsborough and Saundersfoot without seeing a single insect of special interest. A few *Pyrameis cardui* occurred; *Sciaphila conspersana* and *Sericoris cespitana* were found on the sandhills; also *Spilonota incarnatana*. A run over to Cuxton, in Surrey, on June 23rd resulted in my getting, for the first time, *Oxyptilus parvidactyla*. I bred in September, from a larva found feeding in July on a ripe Canary banana, a moth which has been identified for me at the British Museum as *Sesamia* (*Sesamia*) *vuteria*, Stoll.—F. G. Whittle; 7, Marine Avenue, Southend, September 7th, 1911.

Lepidoptera of Scotland in August.—I spent a fortnight in August on an entomological trip to Scotland—the first week at Forres, in company with my friend Mr. W. C. Cope, the second week at Kinloch, Rannoch, by myself—and I thought that some of your readers might be interested in a few notes on what I saw. During the whole period there was no rain, except for a slight thunderstorm the night of my arrival at Kinloch. Every day was fine and bright, and the nights as a rule mild, except that a cool easterly wind blew on three or four nights at Kinloch. Owing to the weather conditions sugar was a blank, and watching heather-blossom had to take its place. At Forres, our chief resort was the riverside, near the Ferry, the Findhorn Sandhills, and the Culbin Sands and Buckie Loch, where, as the shooting is preserved, we had to obtain leave to go. By the riverside we found *Melanthia rubiginata* common, with a fair percentage of var. *plumbata*, *Coremia imminata* in numbers on the ragwort, a few *Plusia bractea* at *Teucrium*, *Selene*, and other flowers, five or six *Noctua depuncta*, and an odd *N. dahlii* or two. At the Findhorn Sandhills we took *Agrotis cursoria* in very handsome varieties, *A. valligera*, *A. tritici*, *A. nigricans*, *Triphæna orbona* (var. *curtisii*), and several *Stilba anomala*, and *N. festiva*. On the

Culbins, the small birch-bushes gave larvæ of *Notodonta dromedarius* and *Acronycta leporina*, and those on Buckie Loch, numbers of *Demas coryli*, *Orgyia antiqua*, *N. dromedarius*, *Ennomos tiliaria* and *E. angularia*, *Phalera bucephala*, and one *Cerura furcula*. Working there at dusk was most disappointing, as we took nothing but *C. munitata* and *Phibalapteryx lignata*. At Kinloch, Rannoch, I confined myself entirely to the south side of the loch, and except for one fruitless journey to the Black Wood never went farther than Cairie. One day after *Larentia flavicinctata* only gave me four specimens, but *L. cæsiata* was very common. I also took a dozen or so *Carsia imbutata*, but they were getting worn, and I released most of them. I saw no *D. obfuscata* at all. Larvæ comprised *N. ziczac*, *N. dromedarius*, *A. leporina*, *C. or*, *C. duplaris*, *O. antiqua*, *D. coryli*, *S. populi*, *S. ocellatus*, *N. dictæoides*, *C. furcula*, &c. The last-named I beat from sallow, but on arriving home, being pressed for room, I put them in a breeding-cage in which were other larvæ of various sorts feeding on aspen, and, to my surprise, the *furcula* entirely forsook the sallow and fed on the aspen! My nights were spent watching heather-blossom on the flat at the south-east corner of the loch, and the bag contained representatives of *S. anomala*, *N. dahlii*, *D. suspecta*, *N. glareosa*, and *E. lutulenta*. The last day of my visit (August 19th) I took six *Polia chi* (quite normal) off the roadside walls. The number of insects taken altogether was not great, though they comprised a good variety. Larvæ I found very scarce, except perhaps at Buckie Loch and in Cairie Wood. But I much enjoyed the Scotch air and the beautiful weather.—PERCY C. REID; Feering Bury, Kelvedon, September 9th, 1911.

ERRATUM.—Page 324, line 29, for "I. C. Gunton" read "H. C. Gunton"; and line 30, for "August 9th" read "September 9th."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, June 7th*, 1911. — The Rev. F. D. Morice, President, in the chair. — The Secretary observed that he had exceeded his instructions with regard to the Memorial passed at the last meeting, on the subject of the South Kensington site, and had sent it to the 'Times,' where it had appeared, and to the principal Press Associations, as well as (at the request of Mr. Waterhouse) to the Director of the Natural History Museum.—Commander J. J. Walker exhibited specimens of *Barypithes pellucidus*, Boh., from Oxford, Enfield, and Tavistock respectively, and for comparison, *B. duplicatus*, Keys, from the Blean Woods and Birchington, Kent. Also a series of specimens illustrating the life-history of *Cyclotorna*, Meyrick, a genus of myrmecophilous Lepidoptera, from Queensland, sent by Mr. F. P. Dodd with his paper on the insects subsequently read.—Mr. Donisthorpe, live specimens of *Antennophorus uhlmanni*, Haller, on the hermaphrodites from a nest of *Lasius umbratus* at Woking. Only two specimens have been taken before in Britain, by Michael, in an ant's nest at Land's End. Also *Uropoda philoctena* fastened on the strigil of an hermaphrodite of the same ant from the same locality. This species is new to Britain.—Mr. C. O. Waterhouse, larvæ of a species of *Hypoderma* received from India from Mr. J. E. Middleton, with a note that they had been taken from a gazelle and were probably an undescribed species. Mr. Waterhouse expressed the strongest doubts as to the possibility of determining a species of *Hypoderma* from the larvæ. There is, however, no Indian *Hypoderma* described hitherto.—Mr. F. Enock, a photomicrograph of a new species of *Mymar*, which he has named *M. regalis*, accompanied by one of *M. pulchellus* for comparison, captured June 3rd, 1911, at Burnham Beeches. Not only are the posterior wings greatly elongated into a very narrow battledore with six long hairs on the lower margin, but the anterior wings are surrounded with *sixty* long hairs—instead of the thirty-five of *Mymar pulchellus*.—Mr. H. Rowland-Brown, some drawers of Miss Fountaine's bred series of African *Charaxes*.—Dr. Chapman, a box of insects to illustrate a case of mimicry, remarking that in March and April, both at Hyères and at Amélie-les-Bains, his attention was attracted to a Reduviid bug, *Pirates hybridus*, Scop. He followed up one or two on the wing, taking them for Pompilid Hymenoptera, and when they settled on the ground their movements were precisely those of *Pompilus* when hunting on the ground—sharp, active, jerky, and taking wing at once if alarmed. The red colouring on the elytra was, when running, much like the red of a Pompilid body between or under the wings. On picking up the bug, it often occurred that one was stung, about as sharply as many Pompilids do, and some are fairly proficient therein. The sting was of course the thrust of the beak or proboscis, of which not a few Reduviid bugs can make effective weapons of defence. The sting enhances the resemblance to an Aculeate. Dr. Chapman also observed that at Hyères, on March 29th, 1911, he found, on turning over a stone, under its edge a small nest of *Polistes gallica*. The nest consisted of eight small cells, in each of five of which was one egg. It could not have been founded very long. Under it (above it before the stone was turned over) there rested not one female but two females side by side. The advancement of the nest showed that it was impossible for one of these to be a worker reared in the nest. The question was, were they working together, or was one only a casual visitor, taking shelter during the inclement weather? In the latter case, would it not have been regarded and treated as an enemy, instead of both resting together in a thoroughly friendly way? Dr. Chapman also exhibited some well-grown larvæ of *Callophrys avis* from the Riviera. —Professor Poulton, on behalf of Mr. A. H. Hamm, assistant in the Hope Department of the Oxford University Museum, a case of insects illustrative of certain associations of mimetic British Hemiptera-Heteroptera, with their hymenopterous models, the chief object being to record that the Hemiptera are to be found in the localities frequented by their models, and often in their company. Field observations are especially important on the mimics of insects, such as the Hymenoptera-Aculeata, with extremely characteristic habits and movements.—Professor Poulton, a family of *Papilio dardanus*, consisting of the *trophonius* parent and the fifty-five offspring reared from her eggs by Mr. G. F. Leigh, F.E.S., of Durban, and containing a new female form *leighi*. The female parent of the family exhibited was captured by Mr. Leigh on June 26th, 1910, at Pinetown, Natal (about 1000 ft.). She laid sixty-two eggs on June 27th–28th, the offspring consisting of twenty-five males, twenty-two *cenea* females, four *trophonius* females, two *hippocoon* females, and two *leighi* females. There can be no doubt that this variety, bred in Natal by Mr. Leigh six times in 1910 and also captured twice in Natal, possesses sufficient stability to rank as one of the female forms of *dardanus*. Further convincing evidence of its stability as a form is seen in the fact that it also occurs almost unchanged so far away from Natal as the north-east corner of the Victoria Nyanza. A specimen was collected by Mr. A. H. Harrison about 1903 at "Nyangori," a forested locality at a height of about 5000 ft. to the north-east of the great lake. Mr. Harrison's specimen was figured, seven-eighths of the natural size, in Trans. Ent. Soc. 1906, plate xx. fig. 1. It is there spoken of as "intermediate between *planemoides* and *cenea*." The *planemoides* form is entirely unknown in Natal, and indeed in areas far to the north of it, and hence it is impossible to adopt the plausible interpretation of *leighi* as a hybrid between *cenea* and a male bearing the *planemoides* tendency, or *vice versa*. We are therefore driven to the hypothesis that the *leighi* form is a persistent definite stage in the evolution of *planemoides*. Professor Poulton also exhibited an example of the *planemoides* female captured in August, 1910, in forest country (less, and probably much less, than 100 ft. elevation) betwen Jilore and Malindi. The occurrence of *planemoides* on the east coast, so far from its *Planema* models, is of high interest. Professor Poulton also exhibited a female parent of the *dubia* form captured on March 19th, 1911, at Oni, seventy miles east of Lagos, by Mr. W. A. Lamborn, together with a selection from the offspring reared from its ova. The offspring included both *dubia* and *anthedon*. Thus Mr. Lamborn had been able to verify the suggestion that the forms *Euralia anthedon* and *E. dubia* are the dimorphic forms of a single species. It may be added that Mr. Lamborn has now bred families from three *dubia* parents of various forms, and one from an *anthedon* parent, all captured at Oni in March of the present year. Both *anthedon* and *dubia* appeared in all the families. Mr. W. A. Lamborn had intended to show at this meeting the cases which he had exhibited at the Conversazione, but, owing to a misunderstanding, they had not arrived. He observed, however, that Professor Poulton's account of the mimicry of certain Danaine butterflies by Euralias induced him to mention that he recently took at one sweep of the net two butterflies, an *Amauris psyttalea*, Plötz, and an *Euralia dubia*, which were flying round and round each other in a manner suggestive of courtship. Their movements on the wing were so active that he was unable to recognize them before capture, and it seemed evident that the one must have been deceived by the mimetic resemblance to its own species exhibited by the other. In the exhibit which he had hoped to bring was a West African Hypsid moth determined by

Professor Poulton as *Deilemera*, probably *antinorii*, Obth., with the cocoon from which it emerged, which bears a large number of creamy white semi-transparent frothy spheres which bear a very strong resemblance to the cocoons of Braconid parasites, and doubtless have a protective function. He added that in January of this year he observed a male *Amauris niavius*, L., settle on the upper surface of a leaf with its wings expanded. The insect flexed its abdomen, making the dorsal surface convex, so that the extremity of the body was brought level with the brands, and the tufts were then thrust out. By alternately flexing and straightening out the abdomen the tufts were passed to and fro over the surface of the brands as though some secretion was being conveyed from the one to the other. Professor Poulton has suggested that the greasy appearance of the brands may be probably interpreted on the hypothesis that they serve to retain and distribute a scent employed in courtship brought to them by the tufts. Dr. Longstaff said that he was satisfied that in *Euplœa* and *Limnas chrysippus* the characteristic scent was not caused by the tufts and brands, though these were very likely the cause of another volatile scent which certainly existed in these cases. Female Danaids have a scent as well as males; the scent common to both being nauseous, while that peculiar to the male is probably a help in courtship. Professor Poulton remarked that the brands actually are greasy, and not merely look so, and that they may for a time hold scent imparted by the tufts. Dr. Jordan observed that the discovery in Natal of intermediates between *cenea* and *planemoides*, which from previous experience had been supposed not to exist, made it impossible any longer to argue from their non-existence in favour of the sudden, as opposed to the gradual, evolution of dimorphic forms.—Commander J. J. Walker read the following paper: "Some Remarkable Ant-friend Lepidoptera of Queensland," by F. P. Dodd, F.E.S., with Supplement by E. Meyrick, B.A., F.R.S.—George Wheeler, *Hon. Sec.*

The South London Entomological and Natural History Society.—*July 27th*, 1911.—Mr. R. Adkin, F.E.S., in the chair.—Mr. Kenneth J. Blair, of Highgate, N., was elected a member.—Mr. West, numerous interesting captures in the New Forest, including *Ægeria spheciformis*, a suffused specimen of *Anthrocera trifolii*, a short series of *Cicadetta montana*, including the rarely met with female, and the rare Heteropteron *Eysarcoris æneus*.—Mr. Stanley Edwards, the very beautiful Lycænid *Stalachtis evelina* and several beautiful species of the genus *Mesosemia* (Lemoniinæ).—Mr. R. Adkin, a pair of *Endromis versicolor* reared this year from ova deposited in 1908, thus three years in pupa.—Mr. Blenkarn, a teratological example of *Carabus nemoralis*, in which the tibia of the right fore leg was divided into three, each terminating in perfect tarsi and claws; two specimens of the rare *Helophorus tuberculatus* and *Galerucella fergussoni* from Lanarkshire; and the curious Hemipteron *Ledra aurita* from West Wickham on oak.—Mr. Jäger, a Nematoid worm which had emerged from the larva of a *Cucullia*.—Mr. Sperring, a number of aberrations of Lepidoptera, including a smoky suffused specimen of *Cosmotriche potatària* from Benfleet, a seven spotted *Anthrocera* *filipendulæ*, a *Callimorpha dominula* with very dark hind wings and ill-developed scaling, two specimens of *Arctia caia*, one having asymmetrical markings and the other with yellow hind wings, and a number of *Abraxas grossulariata*, considerably darker than normal specimens, many having the black massed mainly towards the outer margin. He called attention to the fact that most of the bred aberrations were either early or late emergences of the brood.

August 10*th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Jäger exhibited a specimen of the large spider *Mygale avicularia*, sent to him from India, and communicated notes on its habits. He also showed a specimen of a scorpion from the Asiatic shore of the Bosphorus, and described its habits.—Mr. West (Greenwich), a series of *Asemum striatum* and var. *agreste* from the New Forest, a male and two females of the very rare *Monochamus sutor* from Deptford, *Acocephalus tricinctus*, a recent addition to the British list from Great Yarmouth, with *Plagiognathus albipennis*, obtained from *Artemisia maritima*, *Aræspus pulchellus*, and *Chlorina glaucescens*, all from the same place.—Mr. Carr, the two grasshoppers *Stenobothrus bicolor* and *Platycleis brachyptera*, from Oxshott.—Mr. Blenkarn, *Quedius talparum* (*vexans*), recently new to science, from moles' nests in the Isle of Wight, and a double-banded form of *Noctua rubi* from Beckenham.—Mr. Dods, living larvæ of *Samia cecropia*, a large American silk-producing Saturniid.—Mr. Carr, the local beetle *Cicindela sylvatica* from Oxshott.—Mr. Edwards, a box containing several species of the genus *Libythea*, and contributed notes on the singular distribution of the few known species.

August 24*th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Jäger, the following forms and aberrations of British Lepidoptera, very dark *Argynnis aglaia*, *Pieris napi*, and *Venusia cambrica*, *Rumicia phlæas*, with wedge-shaped spots replacing the band, a very silvery female of *Celastrina argiolus*, two very curious dark forms of *Acidalia marginepunctata*, and a very aberrantly marked form of *Hydriomena ruberata*.—Mr. S. R. Ashby, series of *Balaninus nucum* and *Phytodecta pallida* taken during the Field Meeting at Clandon, July 15th.—Mr. Turner, forms of *Papilio podalirius*, including var. *feisthamelii* ab. *ornata*, and two examples partaking of the ab. *undecemlineatus* and ab. *nigrescens* forms.—Mr. Turner contributed a note on the habits of the thread worm, one of which had been recently exhibited, found in the larva of a *Cucullia*.—Mr. R. Adkin, forms of *Hesperia malvæ* closely approaching var. *taras* from Sussex, and an intermediate example of *Aplecta occulta* from Rannoch, where the species is usually very dark.—Mr. Morford, *Colias hyale* and a second brood specimen of *Nisoniades tages* from Mickleham, August 20th.—Mr. West (Greenwich), two local Diptera, *Ceroxys pictus* and *C. omissus*, from Great Yarmouth salt-marshes.—Mr. West (Ashtead), the rare burying beetle, *Necrophorus interruptus*.—Mr. Main, a portion of wasp-comb, and described the feeding of the larva.—Mr. Edwards, *Papilio codrus* and allied species.—Mr. Blenkarn, several living stick insects, *Dixippus morosus*, from India.—Mr. Kaye, a specimen of the extremely rare Sphingid, *Pholus typhon*, from Mexico.—Dr. Chapman, living larvæ of the high level

Lycænids, *Latiorina orbitulus*, *Vacciniiana optilete*, and *Albula pheretes*, from the Alps.

September 14*th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Turner exhibited a photograph of a very dark specimen of *Lithosia deplana* (*helveola*), sent him by Mr. Cockayne, and asked if such melanic specimens had been recorded.—Mr. Grosvenor, an extensive series of *Pieris napi* taken and bred in 1911, selected to show every phase of variation obtained, including a gynandromorph, a male with female markings, specimens of yellow general coloration, &c. — Mr. West (Greenwich), *Teratocoris antennatus* and *Nabis lineatus*, two uncommon species of Hemiptera from near Gravesend.—Mr. Gibbs, long and varied series of *Satyrus semele* var. *aristæus*, *Pararge megæra* var. *tigelius* and *Epinephele jurtina* var. *hispulla* from Corsica.—Mr. Kaye, young larvæ of *Rumicia phlæas*, *Plusia bractea*, and a very rare Sphingid, *Xylophanes isaon*, taken by him in South Brazil.—Mr. Curwen, a large number of aberrations of British Lepidoptera.—Dr. Chapman, empty and full galls of *Andricus ostæus*, the peppercorn gall.—Mr. Barrett, living larvæ of *Syntomis phegea* from Sicily.

September 28*th*.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Kaye exhibited a long series of *Ephyra pendularia*, including some very beautifully marked examples of ab. *subroseata*.—Capt. Cardew, a beautiful series of *Hadena contigua*, bred from ova laid by a New Forest female; forty-nine imagines were obtained from sixty-two fertile ova.—Mr. Moore read a short note on a visit to the Forest of Arques recently made, and exhibited a number of butterflies he obtained. He referred to the abundance of *Pieris napi* and the scarcity of *P. rapæ* in the forest about August 12th last.—Mr. Moore exhibited a specimen of *Agrius convolvuli* taken in Deptford, the only one noted by him this season.—Mr. Main, a bred example of *Aplecta prasina* (*herbida*) remarkable for the delicacy of its colouring. Some of the larvæ, he remarked, were still small, others had pupated, and this moth had emerged. — Mr. Buxton, a long series of *Hadena protea* from near Tonbridge, taken at sugar, and of *Anthrocera hippocrepidis* (?); one specimen of the latter had the antennæ short, but very thick and contorted.—Hy. J. Turner, *Hon. Report. Sec.*

Lancashire and Cheshire Entomological Society. — The opening meeting of the session was held at the Royal Institution, Colquit Street, Liverpool, on Monday, October 16th, 1911.—Dr. P. F. Tinne, Vice-President, in the chair. — This being the meeting of the Society fixed for exhibits, these were the feature of the evening.—Mr. B. H. Crabtree brought a fine bred series of *B. repandata* from Cornwall and Delamere; a very fine and varied series of *E. autumnaria* from Southend ova; *A. ashworthii* and *lucernea* from Penmaenmawr; *H. suasa* from South Manchester larvæ; *A. nebulosa* and var. *robsoni* from Delamere larvæ; *A. selene* and *C. davus* from Haverthwaite Mosses; *E. epiphron*, *A. plantaginis*, and var. *hospita* from the Westmorland mountains.—Mr. R. Tait, Junr., exhibited a long series of *A. grossulariata* from a garden in Huddersfield, showing an exceptional range of variation; *B. repandata*, including var. *conversaria*, Penmaenmawr var., &c.; *D. falcataria*, *D. russula*, *A. strigillaria*, *M. murinata*, *G. papilionaria*, *C. mesomela*, *A. tincta* from Wyre Forest, June, 1911; bred typical form of *P. betularia* from Pendine, South Wales, 1911; *A. advena* and *B. roboraria* from Monkswood, June, 1911.—Dr. P. F. Tinne's exhibit consisted of a nice series of variations of *Polyommatus phlæas* collected on the coast of Donegal during August, 1911. These included var. *argentea* and specimens showing extreme forms with light and heavy black markings.—Mr. Wm. Mansbridge had a long series of *Selenia bilunaria* showing dense fuscous irroration, from a Delamere female; also a new form, ab. *brunnearia*, from the same locality; a long series of *Aplecta nebulosa* and vars. from *robsoni* parents. The results were contrary to usual experience with this parentage, the progeny being as follows: 49 per cent. *robsoni*, 6 per cent. *thompsoni*, and 45 per cent. grey forms with typical markings; the last being remarkable as showing a full range of variation *inter se*, from the palest Delamere variety to the darkest, nearly all, however, possessing the typical markings; a series of *Abraxas grossulariata* from Huddersfield, which included the usual well-known West Riding variations.—Mr. A. W. Boyd exhibited a box of Micro-Lepidoptera collected in Lancashire and Cheshire during the past season.—Mr. F. N. Pierce, a box of Huntingdonshire Lepidoptera.—WM. MANSBRIDGE and OSCAR WHITTAKER, *Hon. Secs.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*June 6th*, 1911.—*Epione apiciaria*. Mr. A. W. Mera exhibited larvæ of this species and remarked on the prolonged period of hatching of the ova which resulted in some being still unhatched, while these larvæ were almost full-fed.—*Eupithecia extensaria*; a living imago bred from Hunstanton larva. Mr. L. B. Prout.

June 20th, 1911.—*Nola confusalis*, melanic; a series from Epping Forest, including one very dark example. Mr. H. B. Williams.—*Selene illunaria*, ab.; a specimen of almost unicolorous grey colour with usual transverse lines only very faintly indicated. *Ibid.*

September 5th, 1911.—*Lycæna corydon* abs.; a series from Royston (Camb.), including var. *semisyngrapha* and two brown suffused under sides. Mr. C. P. Pickett.—*Lycæna argiolus*, dwarfs. Two very small specimens of third brood from Leytonstone. *Ibid.*

September 19th, 1911.—*Uropteryx sambucaria*; two series, the one bred in heat and the other at ordinary temperature; the former were on the whole slightly larger. Mr. C. P. Pickett.—*Tephrosia crepuscularia*; second brood series from New Forest and Swansea; those from the latter district were very dark. Mr. A. W. Mera.—*Emmelesia albulata*; a bred series from Shetlands. Mr. F. B. Cross.—*Ennomos autumnaria*; a single specimen taken wild at Ramsgate. September 11th, 1911; also long series from Dover and Chichester, Mr. A. J. Willsdon.—*Catocala nupta*, ab.; an example from Finchley with usual red ground colour of secondaries replaced by purplish brown. Mr. B. S. Williams, on behalf of Mr. Bloomfield.—*Lycæna corydon*, abs.; a series from the North Downs, including males with broad bordered primaries, male approaching ab. *fowleri*, another with orange on secondaries, and a female with right primary cream coloured and left secondary cream streaked with brown. Mr. T. H. Grosvenor.

October 3rd, 1911.—*Calamia phragmitidis*, ab. Mr. G. Brooke exhibited a specimen from Wicken with a small striate black spot just below centre of costal streak.—*Melanargia galatea.* Mr. C. P. Pickett a series reared in a greenhouse from Folkstone larvæ; the most noteworthy specimens were: upper sides, males with black markings much increased, males with central area of primaries almost devoid of black; under sides, males with black markings much reduced, two males with black markings much enlarged, and ground colour suffused with blue-black tinge.—*Pieris rapæ*, third brood; from Leytonstone a spotless male, and female with spots coalescent; on the under side the whole brood showed a yellowish ground colour thickly powdered with black scales. *Ibid.*—*Polyommatus phlæas*, abs. Mr. A. J. Willsdon a number of specimens from Deal district, 1911, including two with copper marginal band on inferiors almost obsolete, one with left superior pale straw colour, and a very large specimen with abnormal development of blue spots on inferiors.—*Agrotis ripæ*; early pupation. Mr. F. B. Cross reported that larvæ taken nearly full-fed in August had completed the change to pupæ during September.—Mr. J. E. Gardner recorded having observed an extraordinary number of Lepidoptera attracted to the electric lamps at Amherst Park in July, sixty species being counted round one lamp. —S. J. Bell, *Hon. Sec.*

OBITUARY.

In the death of Dr. Samuel Hubbard Scudder (May 17th, 1911) America has lost one of her greatest entomologists, and the science a distinguished votary. Among his greater achievements was that indispensable volume 'Nomenclator Zoologicus,' in which were listed all the generic and family names applying to animals. Publication of this important work was commenced in 1882 and completed in 1884. In 1889 Dr. Scudder published 'Butterflies of the Eastern United States and Canada,' a beautifully illustrated work (three 4to volumes), in which the subject was treated in a novel way, and many changes in generic nomenclature introduced. As Professor Cockerell remarks ('Science,' n. s. vol. xxxiv. p. 338): "Scudder was both architect and builder of his great works, responsible for everything, very rarely seeking collaboration, except for the purpose of gathering materials." As an orthopterist, Dr. Scudder ranked very high; he was also a leading authority on fossil insects.

From 1883–1885 he edited 'Science,' and was editor of 'Psyche' for many years. In 1895 he was elected an Honorary Fellow of the Entomological Society of London.

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LIFE-HISTORY OF *ANOSIA PLEXIPPUS*.

By F. W. Frohawk, M.B.O.U., F.E.S.

My success attained in working out the complete life-history of *Anosia plexippus* is entirely due to the kind and untiring assistance of the Hon. N. Charles Rothschild, also Dr. A. Skinner, of Philadelphia, and Mr. J. H. Gerould, of Hanover, N.H. To these three gentlemen I offer my sincere thanks.

After repeated failures in attempts made in sending living females of this fine butterfly across the Atlantic, I at last received from Mr. Gerould two females alive, which arrived at 9 a.m., August 8th last. I immediately opened the package, when they at once crawled out with protruding tongues probing about for moisture, whereupon I dipped my finger into sugar and water, upon which one clung for an hour, drinking the whole time. After such a long drink without moving I took it off, but it evidently would have continued its feast longer had I spared it the time. The other also greedily fed on the liquid.

I then placed them both on the only growing plant of *Asclepias cornuti* (milk weed) which survived the hot summer weather, and stood them in the sun, it being a hot cloudless day with a shade temperature of 80° at 11 a.m. By 2 p.m. I found seven eggs were laid, five on the upper and two on the under surfaces of the leaves. Many more eggs were deposited at intervals during the following fortnight, but all those laid by the most perfect specimen proved to be infertile.

The first egg laid at noon, August 8th, hatched at 5.30 a.m., August 12th, remaining only three and three-quarter days (about ninety hours) in the egg state.

It is owing to the very short period of time occupied by the egg that I failed in completing the life-history last year, when Dr. Skinner very kindly sent me a supply of larvæ in different stages, together with a few eggs. These were dispatched from Philadelphia on May 31st, 1910, and reached me on June 7th, consequently by this lapse of time the eggs had hatched and I found a few small larvæ just previous to the first moult. One of these I immediately figured and described, and subsequently succeeded in working through all stages and bred a fine series of imagines from the various larvæ received, therefore it only remained for me to secure the eggs to enable me to complete the life-history of this remarkable species. As stated above, I accomplished this by the assistance rendered by Mr. Gerould's success in sending me the living females. I will now proceed to describe the various stages.

The egg is conical in shape, closely resembling an acorn in form, but the apex slightly more pointed; it is small in comparison with the size of the butterfly, measuring only $\frac{1}{20}$ in. in height; there are from twenty to twenty-three longitudinal keels (the number varying in different specimens), about fourteen of these run the entire length, from summit to base, the remainder commence about one-fourth from the apex and run to the base; it is ribbed transversely by about thirty-four in number, which extend over the whole surface; excepting the micropyle, which is reticulated with a network pattern.

The colour when first laid is a very pale primrose-yellow, and remains unchanged until the third day when it becomes pearl-white, mottled with yellow and leaden-coloured markings, which first indicate the development of the young larva; it gradually loses the yellow, and a crescent of leaden spots appears on the side denoting the dark feet, and the crown becomes wholly dark leaden colour from the black head showing clearly through the shell.

Immediately after emerging from the egg the larva eats the greater part of the shell, which forms its first meal, usually only leaving the base. It makes its exit by eating away the crown. At 5.30 a.m., August 13th, I watched a young larva feeding on its empty shell; when it had done, it crawled away and found an unhatched egg close by, which it at once started to devour, biting through three of the keels, when I stopped it from doing more damage, and put it on to a terminal leaf of *Asclepias*, upon which it immediately began feeding and soon perforated the entire substance.

Directly after emergence the larva measures $\frac{1}{12}$ in. long; the head is large, black, and shining, with a few fine black hairs, eye spots olive, and mouth parts pearl-grey; the body gradually tapers to the posterior segment which bears a dorsal olive-brown disc; on the second and eleventh segments are pairs of subdorsal olive-brown knobs, and a pair of transverse subdorsal discs on the first segment. Along the body are rows of black bristles, the tips terminate with extremely minute knobs, each bristle is set on an olive-coloured conical base, there are four above each spiracle on either side, and two below, making six in all, one dorsal, two subdorsal, one super-spiracular, and two sub-spiracular; others are placed on the legs and claspers. The segments have four subdivisions.

The ground colour is a pearly-grey with a very slight yellowish tinge in shadows. The second subdivisional wrinkle is light brown, forming a band which gives a ringed appearance to the larva. The surface is covered with minute black granulations; the legs are black, and claspers olive-black and pearly-ochreous.

Before first moult it measures $\frac{3}{16}$ in. long; the ground colour is pearly-ochreous-white with a black stripe encircling each segment. The first larva, which hatched 5.30 a.m., August 12th, moulted first time 6 p.m., August 16th, being four and a half days in the first stage.

Before second moult it measures $\frac{5}{16}$ in. long. The head is now similar in coloration to the subsequent stages, being pale yellow, striped with black; the posterior subdivision of each segment is lemon-yellow, each segment is encircled with a black band; the subdorsal knobs are developed into short tubercles.

One which moulted the first time on the evening of June 8th, 1910, fed at very frequent intervals during both day and night in its second stage, and fixed for its second moult on the morning of June 10th, and moulted the following morning, remaining only two and a half days in the second stage.

The one which moulted first time, August 16th, 1911, moulted second time on August 19th. Another which hatched 6 a.m., August 12th, moulted first time, August 15th, and the second time on the 18th.

Before third moult it measured $\frac{1}{2}$ in. long; all the markings of the subsequent stages are now visible.

The larva which moulted second time, June 11th, 1911, fixed itself for the third moult morning, June 13th, and moulted the third time early morning of the 14th.

After third moult it is $\frac{3}{4}$ in. long. In all respects it is similar in both colouring and pattern to the fully grown larva. The anterior tentacles now measure $\frac{1}{7}$ in. long.

Shortly before fourth moult it measures from $\frac{7}{8}$ in. to 1 in. long; the anterior tentacles now attain $\frac{1}{4}$ in. long. All the colours are clear and defined.

Fourth moult, midnight, June 18th. Its first meal after moulting consisted of its cast skin.

After fourth and last moult fully grown, the larva measures $2\frac{1}{4}$ in. long, the body is of uniform thickness, excepting the rather tapering first and last segments. The head is yellow, with three transverse black hoop-like bands, the central one above the mouth is united below, forming a black ⌓, the surface is sprinkled with minute fine black hairs. On each side of the second segment is a long subdorsal fleshy velvety-black tentacle, very slender and cylindrical, densely clothed with extremely minute points, and sparsely sprinkled with fine black hairs. These organs project over the head, are slightly upturned and widely divergent at the tips; while feeding they are kept in constant motion, generally jerked quickly to and fro. On the eleventh segment is a much shorter pair of similar structure. The ground colour of the body is pale lemon-yellow and white, the white forms a broad median band round each segment; the segments are striped and banded with velvety-steel-black, the stripes, two in number on each segment from the fourth to tenth inclusive, reach over the dorsal surface down to the spiracle, and separate the white from the yellow. One anterior, and one at the posterior third, between this and the segmental division is a short transverse dorsal streak; midway between the two larger stripes is a band of the same velvety texture completely encircling the body and enclosing the spiracle, which is also black, above the clasper is a black oblique mark. The black bands extend over the frontal half of each leg and clasper, the posterior half white, the feet of both legs and claspers are shining black. The segmental divisions are broadly black ventrally, tapering to a thin streak dorsally. The entire surface is sparsely sprinkled with extremely small clubbed bristles with dark bulbous bases. These are only visible under microscopic power.

The larva appears of very docile temperament, if I may use the term, as they take but little notice of being disturbed, and if touched while feeding they merely stop for a few seconds and then continue, and are quite content to feed in any attitude they may be placed in; their only object is to be almost continually feeding, consequently they rapidly grow.

The larva described which moulted midnight, June 18th, became fully grown and stopped feeding on the evening of June 23rd; it spun up, attaching itself by its anal claspers to a pad of silk spun on the leaf stalk, on the following morning, and pupated the next morning, June 25th.

Another fully grown larva ceased feeding on June 8th; after roaming about for six hours it spun a silk pad on the gauze covering, and suspended itself and pupated the following evening, June 9th. The next morning the colouring of the pupa had matured. The first two which hatched, August 12th, 1911, became fully grown and stopped feeding on the afternoon of August 26th, and roamed about for many hours. They both suspended themselves the following afternoon and pupated the next afternoon, August 28th, having remained in the larval state sixteen days.

The pupa measures 1 in. long, including the cremaster, and is ½ in. wide across the middle of the abdomen; it is proportionately stout for its length, rounded and remarkably smooth, having no angles or projections. The abdomen is conical and terminates in a stalk-like cremastral process, the whole form producing a beautiful pendant object, especially when viewed either dorsally or ventrally, and from its smoothness, colouring, and general structure it resembles a finely modelled jade ornament encircled and studded with highly burnished gold, rather than a living object.

Lateral view: head blunt and slightly rounded, forming a continuous curve with the meso-thorax; the meta-thorax and first three abdominal segments form a straight inclined line, the abdomen then curving to apex, which terminates in a long shining black cremaster amply furnished with a cluster of black hooks at the extremity, the ventral surface of abdomen rounded, it then runs in a straight line from apex of wings to head.

The posterior edge of the third abdominal segment is beautifully adorned by a dorsal belt reaching to the hind margin of the wings, the knobs of which are tri-coloured; the front edge is intensely black and shining, the hinder half of highly polished nacreous splendour, reflecting the intensely brilliant gilded band on which they are situated; there are six other equally brilliant gilded discs running in an oblique line on each side from the head to the surface of the meso-thorax and one in the disc of wing. In the posterior centre of the anal segment is a medio-dorsal black spot, a pair of black points on the ventral surface, and two black markings running from the cremaster; the spiracles are slightly raised and whitish. The entire structural details are very inconspicuously outlined; the abdominal segments from the third are very narrow, producing a stunted rounded cone. The whole ground colour is a pale glaucous-green; for the first few hours after pupation the colour is a deeper yellow-green and the ornamentations opaque yellow. It is very firmly attached by the cremastral hooks to a small but dense pad of silk.

The first one, which pupated on June 9th, 1911, began to show signs of emergence on June 22nd, by the thorax becoming changed to a duller leaden-green. It gradually turned duller all over and finally became uniformly of a leaden hue, but the gold ornamentation still retaining the brilliancy, and the markings of the imago appeared on the morning of the 24th, and it (a female) emerged at 3 p.m. that day, remaining fifteen days in the pupal state. The imago was fully developed in twenty minutes after emergence.

The descriptions of the colouring of the egg and larva in first stage, given by Scudder in his 'Butterflies of New England,' p. 724, and copied by English authors, do not agree with either the eggs or young larvæ which I had under observation.

Scudder describes the egg as "very pale amber-green, becoming greyish before hatching." All the eggs I obtained showed no green at any stage of their existence; all were very pale primrose-yellow from the first (as I saw some being deposited), and remained unchanged until shortly before hatching when they became still paler. The egg is also stated to be "long and oval in shape." The same author also says the larva in first stage has the "body pale green"; this is certainly misleading, as in no period of its first stage is any green visible. It is pearly-grey, or cobweb colour, when first hatched, and remains almost unchanged, excepting becoming even paler until after its first moult.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA.*

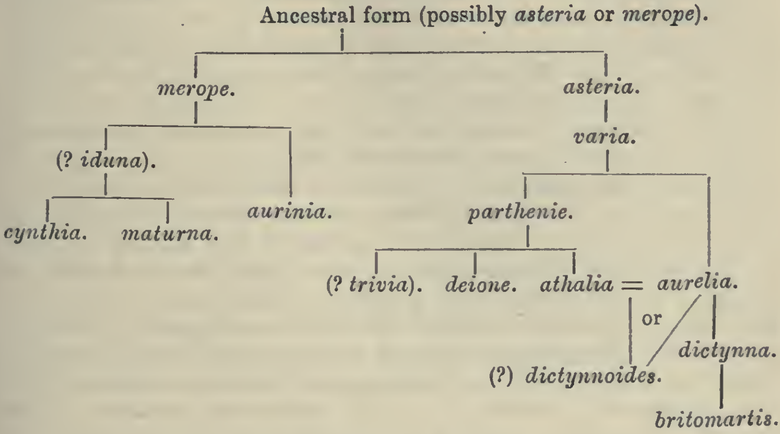
By Rev. George Wheeler, M.A., F.E.S.

(Concluded from p. 267.)

There is one further point with regard to this group which is of great interest, and to which my attention has been turned throughout the time during which I have been studying it, *viz.* its phylogeny, and I have delayed treating of the subject in the hope of being able to come to some definite conclusion. The whole question is, however, so complicated, and the evidence available seems in some respects so contradictory, that I can do little more than throw out suggestions which may possibly be of use in the future, if only as a basis for criticism.

The group consists of a number of ill-defined species, some of which are widespread, some local, and it is equally possible to argue that the latter are the most ancestral forms which have in most places been superseded, or the most recently developed which have not yet spread themselves widely; other considerations seem to show that both arguments are true, and that in different cases the local restriction of species must be referred to opposite causes. In this group, for instance, it is probable that *asteria* and *varia* are ancestral, *deione* and perhaps *dictynnoides* (geologically speaking) modern species. For, in a group like the Melitæids, which are to be found at the extreme heights of latitude and altitude, especially when the same statement is true of the nearly related Brenthids (and most true of the most nearly related forms), it seems probable that the ancestral forms of the group were capable of resisting the cold of the last glacial epoch, and have spread themselves downwards both in altitude and latitude, the oldest forms being those capable of enduring the greatest amount of cold, and the most recent those which are found in the warmest localities inhabited by any members of the group. There may, however, always remain an inherited tendency towards the power of supporting cold, which would enable forms of southern origin to spread northward, as *deione* seems disposed to do, and lowland forms to mount upward, as may possibly be the case with *athalia* and *parthenie*, and even with *dictynna*.

In a group consisting of well-defined species it would no doubt be rash to suggest the direct descent of one existing species from another, but where the species are so ill-defined as in the present group, it appears to me not unreasonable to suppose that this may be the case; yet it is with the utmost diffidence that I hazard the suggestion of the following table, in which doubtless there are many "missing links," and which fails to account satisfactorily for the origin of the *cinxia* group, which is almost certainly, however, the most modern of the three:—



Such a table as this does not of course attempt to give, or even to hint at, the periods at which the evolution of different species began in comparison with each other; for instance, although I think it possible, and even probable, that *deione* and *athalia* had a common origin in *parthenie*, yet I have no doubt that the former is a vastly older form than the latter; the suggestion indeed that *parthenie* is an older form than *athalia*, still more that it is the direct ancestor of the latter, needs explanation. *Athalia* then is the most unsettled form of all in this group, and compares only with *aurinia* in this respect in the elder, though it is exceeded by *phœbe* and *didyma* in the younger group. There are, in fact, scarcely two localities in which this species is quite alike, and in all probability it will split up in the course of ages into many species, some of which will no doubt persist while others will become extinct. It is the extreme want of fixity in this species that first suggested to me the probability of its comparatively modern origin; its connection with *parthenie* is obvious, but it is equally obvious that the connection of *parthenie* with the exclusively high-level (and therefore ancestral) form *varia* is closer than that of *athalia* with the same species, which is a further hint that the latter is the less ancient of the two. It may be fairly replied that such a position is inconsistent with my view that the more southern are the later forms, since *parthenie* is to be found further south than *athalia*. If, however, I am correct in my supposition that the group spread *downwards*, the single-brooded form of *parthenie* will be the older, and I take it that, when the evidently aggressive *athalia* became separated from it, the parent stock was forced to extend its southward range. Here it would be able to emerge earlier in the year, and gradually a double-brooded habit might be formed; as *athalia* advanced further south it would interfere less with *parthenie*, its single brood coming between the two broods of the latter, though *parthenie* would still be urged further southward, to a point to which *athalia*, with its still single-brooded habit, has not yet been able to follow it. It is significant that where the two species are both common, the one is single- the other double-brooded. Where both are single-brooded, *parthenie* is always scarce. The single-brooded habit of *athalia* may probably have been confirmed by the fact that its usual food-plant, Scabious, does not provide food for the hybernated larva till considerably later than that of *parthenie* (plaintain). *Deione*, in the form of *berisalensis*, on the other hand, I imagine to have been evolved from *parthenie* much later, and when and where its double-brooded habit was confirmed. The fact that it has accustomed itself to a food-plant (*Linaria*) which, so far as I am aware, *parthenie* never touches, would preclude any considerable interference of the one with the other. With regard to Caradja's theory that this species arose originally as a hybrid between *phœbe* and either *athalia* or *parthenie* ('Iris,' vi. p. 181), supported (?) by his statement that he has taken it paired with each of the latter species, and possesses "undoubted" hybrids, I would only remark that a few lines further on he accounts for the darker *athalia* of the mountains as being "doubtless" hybrids with *parthenie*, and that in most Pyrenean localities *parthenie* and *deione* are by no means easy to distinguish, while in others the latter bears on the upper side a decided resemblance to the *athalia* of the same localities. The strongest argument for the close common origin of *parthenie* and *aurelia* is the very striking resemblance of their larval and pupal stages, though the ova are more easily distinguished. Of the origin of *dictynna* I feel far more uncertain; that its affinities are rather with *aurelia* than with any other known species admits, I think, of no doubt, and the affinities of the Oriental *plotina* with both add probability to the nearness of the relationship. *Britomartis* may possibly be its immediate parent or its immediate descendant. In the former case it has been almost completely ousted by its descendant; in the latter its double-brooded habit would be a purely southern and comparatively modern development. In 'Iris,' vol. xi. p. 9, Hormuzaki has a most interesting disquisition on the phylogeny of *dictynnoides*, discussing the comparative possibilities of its being an ancestral or a modern form. He also propounds the theory, which he seems disposed to adopt, that it may have been a hybrid form between *athalia* and *aurelia*, not, as he carefully points out and conclusively shows, a direct hybrid, but the descendant of parents of hybrid origin. Recent experiments have shown that such a descent is possible, though it was long imagined to be otherwise, and it cannot be rejected offhand; but its affinities seem rather with *aurelia* than with any other species. It is exclusively an eastern species, the Tatra apparently being its western limit, but I am far from certain that it—or something like it—was not intermediate between *aurelia* and *dictynna*, the latter form arising very early in the history of *dictynnoides*, and spreading west, north, and south, whilst the latter spread east, and became the parent of some at least of the Asiatic forms related to *aurelia*. If it be held that the wide distribution in Western Europe of *dictynna* precludes this possibility, I shall not quarrel with that view: and, indeed, the data are far too fragmentary to serve as a basis for anything beyond the merest hypothesis.

It will be noticed that I have barely touched upon any Oriental forms, my reason being that the very slight knowledge which is obtainable on these species fails to throw any light on the general subject, and indeed only increases the confusion. When more information on these is available, it will be worth while to attack the subject again.

A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

By H. Rowland-Brown, M.A., F.E.S.

(Continued from p. 340.)

(iii) *The Marshland of Gironde.*

Passing over for the present, as outside the limitations of these papers, the entomological results of three weeks' sojourn in the Central Pyrenees, I propose to give a short account of flying visits to the Gironde and the Charente-Inférieure, which will, I hope, interest my brother collectors who contemplate breaking away from the trodden paths to investigate the rich fauna of these western Departments, apparently unworked also by the majority of French collectors of the present day.

After our butterfly-hunt in the lowlands round Biarritz, and in the Western and Central Pyrenees, I found myself alone in Bordeaux on the evening of Monday, July 31st. The thermometer stood at something like 90° in the shade, and the great city, perfumed with the scent of a thousand magnolias, built as it is largely of white stone, refracted the last rays of a tropical sun. My aim and object there was to discover *Chrysophanus dispar* var. *rutilus* in one of the very few regions of France where it is known to survive, and, as subsequent events came about, I was to be by no means unsuccessful in my quest. I may say at once, however, that without the kind assistance, willingly given, of a French lepidopterist—the veteran M. Robert Brown, of Cauderan (who some years ago had given me invaluable information about the butterflies of the south-west)—I could by no possibility have found my way to the particular *terrain* still consecrated to the loveliest and rarest of western "Coppers."

The localities in the near neighbourhood of Bordeaux, specified for *rutilus* (= *hippothoë*, L.) by M. Charles Oberthür in his quite recent 'Lépidoptérologie Comparée' (fasc. iv. pp. 137–155, &c.), have already disappeared. The "marshes" of Baccalou are now part and parcel of the city open spaces—drained dry, and overrun with humanity; and it is necessary, therefore, to go further afield to find *rutilus* at home. Half an hour's journey by tram to Cauderan on August 1st—a cloudless, brilliant morning—brought me to M. Brown's house, where I found my friend awaiting me, and prepared to take the field at once, he having already explored certain old-time haunts of the species only to draw these "coverts" blank. Once more we took to wheels: this time the tram which leads to Le Vigean and Blanquefort—outlying villages—and passes rapidly from suburban villadom into the network of market-gardens which in this direction have invaded the former marshland. We alighted at an opening between two such highly cultivated pieces of land in the neighbourhood of Bruges—a name so suggestive of the Low Countries that I at once asked my companion the meaning of this Flemish-sounding appellation in the midst of a Department which deals chiefly in "acs" and "ocs"—Pessac, Medoc, and the like. His reply was instructive, not only etymologically, but entomologically. Some two hundred years ago the "Grand Monarque," recognizing the possibilities of the soil, composed of detritus brought down by the great rivers from the Pyrenees, colonized the then existing "landes" with Netherlanders as being the most experienced and expert reclaimers—then as now—of such localities. The experiment succeeded. The "landes" were reclaimed, and the process of absorbing the marshes into cultivation still goes on, to the inevitable destruction of all indigenous beasts, birds, and insects—not least of these, *Chrysophanus rutilus*! The same forces, then, which destroyed the "Large Copper" in the Cambridge and Huntingdon fens are in full swing here, and the final extermination of this butterfly over most of the Bordeaux country is but a question of near time.

Pursuing our way down a sandy cart-track, hemmed in between prosperous-looking fruit-farms—a track lined until recently with wet alluvial deposit, and haunted by marsh Lepidoptera—we came in about twenty minutes to a level railway crossing, a few minutes beyond a large farmhouse where entire poplar avenues had been laid low by a recent hurricane, and hereabouts M. Brown informed me I might hope to set eyes on my quarry. Hitherto, beyond swarms of *Epinephele tithonus*, a very small form of *Melitæa parthenie*, and one or two *Celastrina argiolus*, with a single battered *Iphiclides podalirius*, we had seen nothing worthy of a box.

But at this point we entered an unreclaimed fen extending for about a quarter of a mile, narrow in width, but essentially primitive land, with broad ditches dividing it from fields on one side, and the road on the other. I had hardly unpacked my net when the unmistakable glint of copper wings announced us on the right ground, though this proved to be no more than a single stray male from much further on. The sight of occasional heads of the Great Water Dock among many other familiar aquatic plants, punctured and caterpillar-eaten, gave promise of further success; while the whole inland area, entirely dry after the prolonged drought, teemed with butterfly life. *Polyommatus icarus*, a fine bright form; *Loweia dorilis*, small and rather wasted; *Everes argiades*, even more dwarf, *Pyrgus sao*, *Melitæa cinxia*, and *M. parthenie* disputed possession of the fleabane flowers and frequent spires of purple loosestrife, on which also *Lampides bœticus*—a very common "blue" about Bordeaux—disported with *Colias edusa* (I missed a fine ab. *pallida*, Tutt), *Pyrameis cardui*, and other Vanessids. But, the sky becoming momentarily overcast, it was not until the very end of the marsh was reached that I began the chase for *rutilus* in earnest. The few males on the wing at this point were getting worn; the females, rare but in good condition: both sexes very small.

After returning for *déjeuner* to Le Vigean, exploration of the swampy fields further on and a walk back late in the afternoon to the Blanquefort–Bordeaux tramway by the banks of a little river resulted in the capture of some ten or twelve more examples. But I had now all the indications I required, and next day I started work alone at the furthest field from the marsh, whence I was speedily ejected by an excited farmer, though what possible harm I could be doing in all that tangle of weeds, of which his pasture (!) consisted, beats my comprehension. My mild baritone invective was, however, no match for the terrific tenor patois which distracted that good man's vocal chords; and I bowed to the storm. Undisturbed in this same waste the day before, I had come upon two *rutilus* larvæ, one quite small, the other in the last instar, suggesting a somewhat prolonged emergence, though not a few females were already wasted. I handed over these larvæ to M. Brown to rear, my chances of securing food-plant during the next fortnight's travel being altogether hopeless.

The headquarters of *C.* var. *rutilus*, hereabouts, I soon found to be in the low-lying fen, and on the banks of the stream between the Bruges and the Le Vigean–Blanquefort road. On August 2nd males and females were in abundance—rather larger, and both sexes in better condition; while at one point, where the brown peaty water falls over a little weir, and provides an agreeable bath for the lads of the district, I had the extreme pleasure of observing no fewer than eighteen males and six females on a single plant of *Inula dysenterica.*

This Blanquefort locality was known evidently for many years to local collectors of a past generation, but M. Brown informed me that for the moment lepidopterists are scarce in Bordeaux. I find in Trimoulet's 'Cat. des Lépids. de la Gironde' (Bordeaux, 1858):—"Hippothoë, L., June and August. In the marshes on *Inula dysenterica.* At *Blanquefort*, Bègles, Couregéan, &c. Larva in April and June on *Iris pseud-acorus*"—surely a mistake, even if *hippothoë*, Hb., be not the "Copper" intended—as I am sure it is—because *hippothoë*, L. (= *chryseis*, Hb.) does not occur in Gironde, and M. Brown told me that he had himself introduced the late M. Trimoulet to these haunts of *rutilus.* The butterfly, as we have seen, still affects the fleabane. Tutt has collected the various food-plants ('British Butterflies,' vol. i. p. 448), and, with the exception of *Polygonum bistorta*—on the authority of Heyne—they are without exception species of *Rumex.* If Trimoulet had said that the imago *rests* on the *Iris*, I could have endorsed his evidence, for, when the sun was temporarily clouded, I noticed several females sitting on the flag blades, probably conveniently near to the *hydrolapathum*, of which there was plenty in all the ditches and at the edge of the river.

Looking over the series in my cabinet, I find very little variation in the males. They differ chiefly in the degree of visibility of the under-side marginal and antemarginal spots of the hind wings showing through. In the females, which display a considerable difference of size, ranging from about 33 mm. to 40 mm., the tendency to dark suffusion of the hind wings upper side is most marked, while the antemarginal black spots on the fore wings range from light inconspicuous to heavily accentuated dots.

I can only regret that my time should have been necessarily limited to two days, or rather a day and a half, at Bordeaux. The country round is varied, and the lepidopterous fauna rich. Another year I hope I may have the good fortune to be going south in this direction in June, when the first and finest emergence of *rutilus* takes place, the butterfly then being in size no whit inferior to our long defunct and lamented *C. dispar.*

Butterflies observed: Environs of Bordeaux (Gironde), August 1st and 2nd.—*Carcharodus alceæ; Pyrgus sao; Nisoniades tages; Chrysophanus dispar* var. *rutilus, L. dorilis, R. phlæas; Nomiades semiargus; Polyommatus icarus, P. medon; Plebeius argus* (*ægon*)*; Everes argiades; Celastrina argiolus; Lampides bœticus; Iphiclides podalirius; Pontia daplidice; Colias hyale, C. edusa* (and ab. *pallida*)*; Gonepteryx rhamni; Issoria lathonia; Melitæa cinxia, M. parthenie; Pyrameis cardui; Aglais urticæ; Epinephele tithonus; Pararge megæra; Cœnonympha pamphilus.*

(To be continued.)

A REVISED LIST OF THE BRITISH ANTS.

By Horace Donisthorpe, F.Z.S., F.E.S.

I hope shortly to publish the distribution of the ants which occur in Britain, as far as is at present known. It seems to me therefore desirable first of all to publish a list of our species in the proper order and with the correct synonymy.

It is also necessary to place on a proper footing the different species, subspecies, and varieties. Three of the varieties and one subspecies have been added within the last two years, and it is probable that when more attention has been given to our ants, and more collecting has been done, several other species or forms will be found to exist.

I use the term "subspecies" instead of "race," as the former is more generally employed now by myrmecologists, though I think perhaps Prof. Forel's word "race" is more expressive.

The difference between subspecies and varieties in ants is only one of degree. The former is more constant, nearer to the species; the latter exhibits more hybrid forms and transitions.

The following is our list:—

FORMICIDÆ.

Subfamily Ponerinæ.

Genus Ponera, Latr.

coarctata, Latr. (*contracta*, Latr.).
punctatissima, Roger.

Subfamily Myrmicinæ.

Genus Myrmecina, Curt.

graminicola, Latr. (*latreillei*, Curt.).

Genus Formicoxenus, Mayr.

nitidulus, Nyl.

Genus Solenopsis, West.

fugax, Latr.

Genus MYRMICA, Latr.

sulcinodis, Nyl.
lævinodis, Nyl.
ruginodis, Nyl.
scabrinodis, Nyl.
lobicornis, Nyl.

Genus STENAMMA, West.

westwoodi, West.

Genus LEPTOTHORAX, Mayr.

acervorum, Fab.
tuberum, Fab., subsp. *nylanderi*, Först.
,, ,, ,, *corticalis*, Schenck.
,, ,, ,, *unifasciata*, Latr.

Genus TETRAMORIUM, Mayr.

cæspitum, L.

Subfamily DOLICHODERINÆ.

Genus TAPINOMA, Först.

erraticum, Latr.

Subfamily CAMPONOTINÆ.

Genus LASIUS, Fab.

fuliginosus, Latr.
niger, L.
,, subsp. *alienus*, Först.
flavus, Fab.
umbratus, Nyl.
,, subsp. *mixtus*, Nyl.

Genus FORMICA, L.

rufa, L.
,, var. *alpina*, Santschi.
,, var. *rufo-pratensis*, Forel.
,, subsp. *pratensis*, Deg.
sanguinea, Latr.
exsecta, Nyl.
fusca, L.
,, var. *glebaria*, Nyl.
,, var. *rubescens*, Forel.
,, var. *fusco-rufibarbis*, Forel.
,, subsp. *rufibarbis*, Fab.
,, subsp. *gagates*, Latr.

With regard to some of the changes in the above list, I may mention I have placed the Ponerinæ at the beginning of the list because they are the most primitive of all the subfamilies of ants. In the genus *Myrmica* I have treated them as species, which I have always regarded them to be, instead of subspecies, and Prof. Wheeler refers to them as "the closely allied species, *scabrinodis*, *lævinodis*, &c., which were formerly regarded as mere subspecies" ('Journal New York Ent. Soc.' xix. 1911, p. 163).

The varieties of *Formica fusca*, L., have been quite inaccurately dealt with in this country. It is impossible to tell if the various records of *rufibarbis* and *cunicularia* really refer to the subspecies *rufibarbis*, F., or one of the vars. of *fusca*. (*F. cunicularia*, Latr., is really a synonym of *rufibarbis*, F.) The var. *fusco-rufibarbis* is very abundant at Whitsand Bay, and all the ants in some of the nests are of a very dark colour, being intermediate between lighter *fusco-rufibarbis* and *glebaria*. The former lives chiefly in the sand on the borders of rivers, lakes, and by the sea; the latter in the earth on the plains. *F. fusca* is more common in woods. Forel says that *glebaria*, *rubescens*, and *fusco-rufibarbis* have more the habits of *F. fusca*, and are not so warlike as *rufibarbis*. On the other hand, I have found the var. *fusco-rufibarbis* is not nearly so cowardly an ant as *fusca* proper, and Crawley tells me this is his experience with *glebaria*. The var. *fusco-rufibarbis* is very silky (with silvery pubescence), darker than *rufibarbis*, the back of the thorax brown, less polymorphic, and much less hairy, especially on the thorax. It resembles *rubescens*, but is more pubescent and less red, more red, however, than *glebaria* as a rule.

It is of interest to notice that the myrmecophilous beetles, *Atemeles paradoxus* and *Dinarda pygmæa* occur with *fusco-rufibarbis* and not with *fusca* proper; the known distribution of both species in Britain being almost confined to the seaside (the first having been found in the Plymouth district, Weston-super-Mare, Isle of Wight, Folkestone, Bournemouth, &c., and the second in the Plymouth district and at Weston-super-Mare), as might be expected from the habits of the *Formica* hosts. Of the former genus, *Atemeles emarginatus*, on the other hand, is only found with *fusca*, and not with its subspecies or varieties; the winter hosts of both *Atemeles* being species of the genus *Myrmica*.

FORMALIN A REMEDY FOR MOULD ON CABINET SPECIMENS.

By W. G. Sheldon, F.E.S.

It is now some thirty-five years since I was informed by the late John T. Carrington that the best remedy for mould on cabinet specimens was "glacial carbolic acid," and from that day until about a year back I used it exclusively for that purpose.

The treatment proved fairly successful until I came to reside in my present house some seven years ago; but in consequence I suppose of the house being a new one, and the walls being full of damp, mould commenced to appear extensively in my collections; and although frequent applications of carbolic acid kept the fungus down, I could not get rid of it.

About a year ago, whilst showing some drawers of my European butterflies to a medical friend, I pointed out to him a fine specimen of *Apatura iris*, the thorax of which was covered with mould.

My friend advised me to use "formalin" which, he stated, he believed to be absolutely fatal to all such growths. I took his advice, with the result that every trace of mould vanished within a few days from my cabinet drawers, and up to the present date there has not been the slightest return of it.

My method is very simple: I pour out a small quantity of formalin into a saucer, stick a wad of cotton-wool on the head of a pin, immerse it in the formalin, and then stick it in the drawer, which must be closed immediately. After a few days the pin and cotton-wool can be removed and the cure is complete. I have not found the slightest damage to a single specimen result from this process.

I was particularly struck with the result of the remedy on a box of large Chinese Sphinges which had been kept in a damp cupboard, and which were in consequence a mass of mould. A few days after treatment with formalin the fungus was not only dead but withered away.

I have made a number of enquiries amongst entomological friends, but cannot find anyone who has used formalin for mould; I am therefore sending this note. Probably there may be some who have used it, and, if so, their experiences, which may possibly have extended over a longer period than mine has done, would be interesting.

Youlgreave, South Croydon: October 21st, 1911.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. Gahan, M.A.

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(Concluded from p. 351.)

The Eucnemidæ and Throscidæ are without doubt closely related to the Elateridæ and Cebrionidæ, and should be associated with them in the same minor group, either as derivative forms, or as collateral descendants from the same ancestors. The Dicronychidæ, recognised by Koble as a family, are only distinguishable from ordinary Elateridæ by having somewhat remarkably modified asymmetrical male genitalia, and a peculiarity in the structure of the tarsal claws. But the Cerophytidæ are very distinct, and their relationship to the Elateridæ is much more remote; so that, if they are to be included in the same group, it is only because they possibly may be a divergent offshoot from the ancestral stock.

The Buprestidæ are in many ways a highly specialized family of beetles, and cannot be ancestral to any of those just named. But at the same time, although it is possible, it is very difficult to see how they can be derived from any of those Elateroid families, the differences being so great, and the connecting links nowhere among existing forms to be found. So far I agree with Lameere. But to me it is equally difficult, and for the same reason, to see how they can be derived from the Dascillidæ. I look, then, upon the Buprestidæ as a very isolated family, whose origin is almost as much of a problem as is that of the Lamellicorns or Longicorns. The wing-venation in this family is quite characteristic, easily distinguishable from that of other beetles, but not very easily to be derived from that of any other family: (1st) the median vein (M_2) has moved forwards towards the radius, and its short recurrent branch comes off at a considerable distance from the apex of the wing; (2nd) the recurrent branch (R_2) of the radius (R_1) lies very close to the latter, leaving only a very narrow cell between; and (3rd) the cubitus appears to have four longitudinal branches, three of them in a position to correspond with the two marked Cu_1 in my figure of the Lampyrid wing on p. 125, the fourth homologous with Cu_2 of the same figure. The cell between Cu_2 and A_1 is generally complete, and then somewhat elliptical in form, with only a single vein continued from it to the margin of the wing, and this vein might be interpreted as A_1 instead of Cu_2, if we did not find both often continued up to the margin, while the anterior three branches are at the same time present. The modifications undergone in the fore part of the wing are not unlike those met with in the Lamellicorns, and might easily enough be explained as derived from the Elaterid or Dascillid type. But it is less easy to account for the additional vein in the cubital area. It may possibly have arisen from the conversion of a vein originally transverse into a longitudinal one, which then further develops; it may be due to the bifurcation of an originally single branch, or it may be an inheritance from some ancestor in which the cubitus had four longitudinal branches. If we accept as correct either of the first two alternatives, then the Buprestid wing may without much difficulty be derived from the Elaterid or Dascillid wing; but if we consider the last of the three as the most probable explanation, we must look for the origin of the Buprestidæ elsewhere.

The male genital organs have been investigated in only a few species of Buprestidæ, and not yet, so far as I know, in any species of Dascillidæ. Their structure in the Buprestidæ is somewhat remarkable, and constitutes what might almost be regarded as a distinct type. Each testis, as described by Léon Dufour in the genus *Corœbus*, consists of five very long, slender, tubular capsules, which, arising from the dilated end of the vas deferens, are intricately coiled up together in a mass, from which their ends emerge, terminating each in a slight oval swelling. In another Buprestid (*Anthaxia manca*), investigated by Laboulbéne, there are six spermatic capsules, which are swollen and somewhat fusiform at the base where they join the efferent duct, and then taper out into long fine tubes, which are coiled together and run into one another, their ends not being free as in the preceding case. It would be interesting to find out not only how far this type of structure occurs in the Buprestidæ, but whether it is to be met with also in any other family. The only other beetles I know of in which the structure is at all similar are the Cleridæ.

In another respect also the Buprestidæ call for some remark and further inquiry. The Malpighian vessels, which in most other families, and even in whole groups, are tolerably constant in number, either four or six, are in this family not at all constant, but appear to be nearly as often the one number as the other. Out of seven species, investigated by Dufour and Laboulbéne, four were found to have six Malpighian tubes and the remaining three only four. In the larvæ he dissected, Dufour found six of these vessels, and not knowing at the time that any Buprestid imago had six, he was led to infer that the larvæ of Buprestidæ had six and the beetles only four Malpighian tubes.* This would be a surprising fact, if true. But the inference was wrong, and the probability is, as Laboulbéne said, that larva and beetle have, in the case of each species, the same number of vessels.

From these different facts I have mentioned concerning the Buprestidæ, it is evident that there is much still to be done before we can finally decide what place that family should take in the ranks of the Coleoptera.

Having but a very limited knowledge of some of the families included in the Dascilloidea of Kolbe, I can hardly venture to go further in the way of criticism than to point out that there is some room for a difference of opinion in regard to the composition and validity of the group. This is evident from Lameere's treatment of the same series of families. He has placed some of them with the Elateroids and Buprestidæ in his group Sternoxia. For the Psephenidæ, Dryopidæ, and Helmidæ he makes a separate group—the Macrodactylia. And he associates together the Dermestidæ, Byrrhidæ, and Nosodendridæ in another group—the Brachymera.

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* Hence, probably, an error, which appears on p. 355 of Packard's 'Textbook of Entomology.'

Coming next to a consideration of the Clavicornia, we find Kolbe in much closer agreement with the views of Lameere although here also there is the slight difference, already noted—the inclusion in the group by Lameere (but with doubt) of two families, the Cioidæ and Sphindidæ, which Kolbe places in the Bostrichoidea; and there is this further and important difference, that Kolbe places the Clavicornia after, not before, the Heteromera. If I had to accept the Clavicornia as a distinct and separate group, independent in origin from the rest of the Diversicornia, I certainly should side with Kolbe in placing them after the Heteromera. There are no doubt points of resemblance both amongst the larvæ and the adults, suggesting a somewhat close affinity between the Heteromera and the Clavicornia, but I consider the latter to be on the whole a more highly specialized group, and one of minor value, that might readily enough be derived from some other of the Diversicornia.

The Heteromera show a considerable amount of diversity in their structure, and it has been suggested, perhaps more than once, that they are not really a natural series, and might be better placed, scattered among various other groups of Coleoptera. That heresy, I am glad to say, has met with no favour from any one of our three authors. They agree to look upon the Heteromera as a perfectly natural and monophyletic family series. In no other way, except as derived from a common ancestor, can they explain the complete disappearance of the missing segment of the hind tarsus, a character met with in every member of the group without a single exception. That character, moreover, does not stand alone, for an intimate study of the different families included in the group tends to show that the view as to their common relationship is on other grounds also well justified. But at what period in the history of the Coleoptera did the first Heteromeron appear? Were the Clavicorns then in course of being differentiated into a group such as we now know them? It is extremely doubtful; and I know of no ancestral feature exhibited by the Clavicorns that would lead us to consider them of earlier origin than the more primitive of the families of Heteromera. The genus *Phrenapates*, between which and some of the more primitive Clavicorns my friend Lameere finds points of affinity, has no right to be regarded otherwise than as a highly specialized form of Heteromeron, and the family to which it belongs—the Tenebrionidæ—no claim whatever to the first place in the family series. In his suggested arrangement of the families in this series, Lameere is considerably at variance with Ganglbauer and Kolbe, and my own opinion in the matter is that his arrangement is wrong, and that the course of development within the group was almost quite the reverse of that suggested by him.

I have now dealt with the three classifications in all but their least important points, and I hope I have given no unfair representation of the views held by their authors. From the criticisms which I have ventured to offer as I went along it will be evident that my own views on the phylogeny of the Coleoptera are in more or less complete accord with those of Ganglbauer. His classification, it is true, is not altogether satisfactory, because it leaves us still somewhat in doubt as to the origin of certain of the groups, but in the present state of our knowledge it could hardly have done otherwise. We may in course of time be better able to see how the Phytophaga and Lamellicornia have been derived. If we are to attach great importance to the pedicellate structure of the testes, common to the two groups,* and believe that it could not have been acquired independently by each, we must look for the origins of both groups very near one another. That they were near one another in any case seems quite probable, and it is only a question with me as to which was the later of the two, and which therefore should come last in the classification.

I think it possible also that the Heteromera, instead of being derived directly from the Protocantharideon, may have branched off at a very early date from the common stem of the Diversicornia—that the Diversicornia and Heteromera may have gone together a little in one direction, the Phytophaga and Lamellicornia together in another, before the final differentiation into the four groups took place. Of these four groups, the Diversicornia, in their lowest forms the Malacodermata, seem to have retained most of the ancestral characters; and the Lamellicornia, taking them as a whole, seem to be the most modified. The Rhynchophora are indeed, as Kolbe maintains, another highly modified group, and if there were no such group as the Phytophaga existing, to which they show so close an affinity, they might very well be placed after the Lamellicornia. All things considered, I agree, then, as in most other points, with the order in which Ganglbauer has arranged the groups, and I think that his classification may well stand for the present as the one best devised to express our knowledge of the phylogeny of the Coleoptera.

* Since writing the footnote on p. 169, I have ascertained from dissections made by myself, and also by Mr. F. Muir, that the testes of *Timarcha* are as described by Dr. Bordas, and of a different type from those of other Phytophaga—a fact which is somewhat disconcerting.

ERRATA.—In the last paragraph on p. 124, and the first two on p. 125, for M_2 read M_1. In the last paragraph on p. 349, and the last on p. 350, for Dascillidæ read Dascilloidea.

A SECOND LIST OF THE APHIDIDÆ FOUND IN KENT.

By Fred V. Theobald, M.A., F.E.S., &c.

(Continued from p. 356.)

Aphis solani, Kaltenbach.—Wye, June 26th, 28th, July 7th, 1911, a few apterous females beneath potato leaves, and a single winged female on June 28th.

A. tragopogonis, Kaltenbach.—On *Tragopogon pratensis*, Wye, August 12th, 1911, and Herne Bay, July 18th, 1911, and on *Schorzonera* at Wye and Herne Bay, July 15th and 20th, 1911.

A. cratægiella, nov. nom. for.

A. cratægi, Buckton (non Kaltenbach).—Common on the top shoots of hawthorn in hedgerows, Wye, and Godmersham, forming large dense colonies, May 22nd and 29th, June 7th and 10th, July 1st and 18th, September 20th, 1911. One apterous female had black cornicles. Kaltenbach's *A. cratægi* is black, Buckton describes and figures a green species which is quite distinct. The two species I have twice found together.

A. malvæ, Koch.—A few apterous females on the leaves of the dwarf mallow (*Malva rotundifolia*) in Wye churchyard, August 22nd to 27th, 1911. Apparently rare.

A. lappæ, Koch.—On cultivated celery, sometimes freely on the leaves, at others in masses hidden between leaf stalks, Wye, September to November, 1907; also sent me from Ely in September, 1909.

A. cratægi, Kaltenbach (non Koch, non Buckton).—Wye, on hawthorn, May 29th, September 12th, 1911; also from Haddenham, Cambridgeshire.

A. ochropus, Koch.—On *Rumex*, Wye Downs, July 30th, 1911, a single dense colony of winged and wingless females and nymphs.

A. ilicis, Kaltenbach.—On holly leaves, Wye, a few scattered wingless females; also found at Hastings, May 3rd, 1911, a single colony on a leaf.

A. craccæ, Linn.—A few wingless females on *Lotus corniculatus*, along Olantigh Road, Wye. This appears to be the *A. viciæ* of Fabricius.

A. opima, Buckton.—Wye, on begonias, March 27th, 1903, under glass.

A. atriplicis, Buckton (non Linn.).—The only black aphis I have found on mangolds, and which has swarmed and done enormous damage this year, answers to Buckton's description of his *A. atriplicis*. It is, however, apparently only *A. papaveris*, Fabricius. This black *Aphis* curls the leaves and twists them up into crinkled masses; abundant all over Kent on mangolds, most so in Thanet.

A. lactucæ, Kaltenbach.—Wye and neighbourhood. This is a true *Aphis*, found in great abundance on sowthistles (*Sonchus arvensis* and *S. palustris*), also on garden lettuces run to seed. The pale bright green wingless females and larvæ collect in numbers on the flower stalks and fall on being shaken, especially the adult females. First noticed on June 27th and continued on through September. No winged females have been found. The shiny brown

Siphonophora sonchi (Kalt.) now and then occurs, mixed with the colonies, especially towards the end of August; also taken in July at Crundale and Herne Bay, also sent me from Haddenham, Cambs, June 27th. In the first list I recorded *Siphonophora lactucæ*, Kalt., taking Buckton's description. I have since found the true *A. lactucæ* of Kaltenbach; it is certainly a true aphis, with moderately long cornicles. *Siphonophora* (*M.*) *lactucæ*, described by Buckton, has longer cornicles.

A chrysanthemi, Koch.—Wye, on chrysanthemum, September 10th, 1906; also from Great Staughton, Hunts, July 25th, 1904. Schouteden places this as a synonym of Linnæus's *A. cardui*; they appear very distinct to me.

A. atriplicis, Linnæus.—This is quite a distinct species, of a pale green colour, and must not be confused with the *A. atriplicis* of Buckton, a dark, almost black insect which I fail to separate from *A. papaveris*, Fabricius. The true (*i.e.* Linnæus's) *atriplicis* causes the leaves of various chenopodiums and also mangolds to curl upwards from the middle, forming marked boat-shaped galls. I found this insect quite common in the village of Wye, on the small creeping goosefoot (*Chenopodium polyspermum*) and on *Atriplex portulacoides*, and also producing similar deformities on mangolds and sugar beets at Wye and on the former at Herne Bay, Seasalter, and Faversham. Apterous viviparous females occurred from July 7th to September 25th, when a few nymphs were found. The insects have a mealy coat, and there are many oil globules in the galls. It often occurs alongside with *A. papaveris*, Fabricius, *A. chenopodii*, Kaltenbach, and a new species which I am describing.

A. jacobææ, Schrank. — Herne Bay, July 15th, 1911, on ragwort (*Senecio jacobæa*); winged and wingless females.

A. chærophyllii, Koch?.—Wye, July 1st, 1911, on mangold leaves. A few specimens differing from other mangold aphides answered to the description of this species.

A. oxycanthæ, Koch.—On apple leaves and shoots, Wye, June 20th, 1911, and Mortimer, Berks, June 12th, 1911. This black aphis seems uncommon on apple, but appeared in numbers in the two localities mentioned this year, and caused no little harm on some Worcester pearmains at Wye. It probably comes in the genus *Myzus*.

A. chamomillæ, Koch?.—On chamomile plants at Wye, June 6th, 1911. This answers generally to Koch's species, but I am not sure that it is a distinct species from *A. papaveris* until microscopic preparations have been made.

A. loti, Kaltenbach.—Wye, on *Lotus corniculatus* during May. A small black species found singly between the leaves and stems and amongst the flowers; larvæ, apterous females and one nymph. Also at Ecclesbourne Glen, May 12th, 1911.

A. avenæ, Fabricius.—On barley, Wye, June 30th, 1904, wingless females and nymphs, on oats and wheat, Wye, July 7th and September 20th, 1911, the last-named on some self-sown corn by roadside, found both on the blade and in the ears. Schouteden places the *A. fitchii*, of Sanderson, found on apples as a synonym of this species. I have so far not been able to trace the connection between these two insects, both of which occur here, and it is quite likely they are migrant forms.

A. symphyti, Schrank.—Wye, October 13th, 1911. A single apterous female on groundsel flower-head. I have been unable to find more of this very marked species.

(To be continued.)

DESCRIPTION OF OVA AND YOUNG LARVA OF *CHRYSOPHANUS AMPHIDAMAS.*

By W. G. Sheldon, F.E.S.

Whilst at Mattmar in the province of Jemtland, Sweden, I discovered on the under sides of the leaves of *Polygonum viviparum* on June 5th last several Chrysophanid ova. I did not see them actually deposited, but they were identical in every respect with ova I obtained by dissecting a female of *Chrysophanus amphidamas*, and as they differ markedly from the ova of all the other species of *Chrysophanus* occurring in Sweden, which are well known, there cannot be the slightest doubt that they are those of this species.

The description of the ova is as follows: —Horizontal diameter 20 mm.; vertical diameter 50 mm.; diameter of micropyle 15 mm.; shape spherical, somewhat flattened at the crown; colour a clear, frosted white, when looked at from above; but when viewed sideways the ovum has a beautiful opalescent sheen.

The surface is covered by a network of deeply pitted cells, rounded, but with irregular outline; six of these cells surround the micropyle.

Larva emerges by eating a large hole at the apex of the ovum, removing the micropylar area, as well as a portion of the surrounding cells.

The first larva emerged on June 23rd; the micropylar area for the two or three days previous to emergence became of a leaden tinge.

The newly emerged larva is about one millimetre in length, of a dull greenish white colour, thickly covered with long white spines; it commenced at once to feed on the under side of the leaves of *P. viviparum* alongside the midrib, forming a deep channel in which the young larva was almost hidden, and eating the lower cuticle of the leaf only.

The larvæ emerged whilst I was in Lapland, and in consequence of my being unable to keep the food-plant in water, the leaves curled up, which they have a great tendency to do, and probably crushed the larvæ; at any rate I did not see them after they were four days old.

Youlgreave, South Croydon: October 21st, 1911.

NEW GEOMETRIDÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

Spilopera rubridisca, sp. n.

♀. Pale ochreous brown, sparingly dusted with fuscous. Fore wings suffused with reddish on central area; a white centred purplish spot at end of cell; antemedial line dusky, angled below costa, where it is dotted with black; postmedial line purplish brown, oblique from apex to dorsum; some purplish marks below apex; subterminal line, indicated by purplish dots, starts from costa before apex, curves under oblique line, thence almost parallel with it to dorsum. Hind wings have a purplish spot at end of cell—this is centred with white on the left wing, but not on the right wing; postmedial line purplish brown, appearing to be a continuation of the line on fore wings; traces of a dusky subterminal line. Under side similar to above, but the postmedial lines are indistinct, and the subterminal lines are indicated by black dots.

Expanse, 36 millim.

Collection number, 1606.

A female specimen, minus fringes, from Kanshirei (1000 ft.), May 2nd, 1908.

Craspedia indigenata, sp. n.

♂. Whitish brown, irrorated with darker brown, especially on the outer area of all the wings. Fore wings: antemedial line brown, slender, dotted with black on each nervure; medial line brown, very faint, undulate; postmedial line brown, slender, double, sinuous, dotted with black below costa, marked with black about middle and at dorsum. Hind wings agree in colour with the fore wings; discal dot black; antemedial and postmedial lines brown, the former very indistinct, the latter dotted with black. Fringes paler, preceded by an interrupted black line. Under side rather paler than above, lines more distinct.

Expanse, 26 millim.

Collection number, 886.

One specimen from Punkio (4000 ft.), August 4th, 1908.

Near *C. ligataria*, Walk.

Acidalia arizana, sp. n.

♂. Pale brown, the area within the medial line of fore wings and the antemedial line of hind wings suffused with fuscous. Antemedial line of fore wings hardly darker than the area it crosses, angled below costa; postmedial line brownish, nearly parallel with termen; veins beyond the postmedial line whitish, dotted with black; terminal series of black marks between the veins; a black dot at end of cell. Hind wings have the termen slightly angled at vein five; faint black dot at end of cell; antemedial line brown, rather broad; postmedial line brownish dotted with darker; veins beyond postmedial line whitish dotted with black; terminal dots as on fore wings.

Under side whitish, markings similar to those of upper side, but the dots on terminal area less distinct.

Expanse, 28 millim.

Collection number, 883.

A male specimen from Arizan (7300 ft.), September 12th, 1906.

Chrysocraspeda duplicilinea, sp. n.

♂. Fore wings pale yellow, costa reddish towards the base; antemedial line red; postmedial line red, double, outwardly angled below middle; subterminal line red, double, interrupted, marked with purplish towards tornus; a reddish dot at end of cell. Hind wings pale yellow; red lines as on fore wings, but brighter and more distinct; the subterminal line single, followed by a red band on termen. Under side whitish, markings of upper side faintly indicated.

Expanse, 23 millim.

Collection number, 91.

A male specimen from Takow (on the plains), September 2nd, 1904.

Seems to be allied to *C. marginata*, Swinhoe, from Burma.

Anisodes lentiginosaria, sp. n.

♂. Fore wings yellow, freckled with reddish orange; antemedial line dusky, indistinct except towards the costa; spot at end of cell black, enclosing a white speck; a dusky shade-like band just beyond discoidal spot; postmedial line black, undulated, preceded by black dots on veins three, four, and six; area beyond postmedial clouded with purplish and blackish, chiefly towards dorsum; fringes yellow. Hind wings yellow, freckled with orange; antemedial band purplish mixed with black, enclosing a black-ringed white spot; postmedial line purplish mixed with black, preceded by black specks set in reddish orange dots; area beyond postmedial purplish, traversed by an interrupted line of the ground colour. Under side paler, markings fainter.

♀. Similar to the male, but less freckled; the medial line of fore wings and the antemedial line of hind wings are reddish.

Expanse, ♂ 38 millim., ♀ 32 millim.

Collection number, 861.

One example of each sex from Arizan (7300 ft.), August, 1908. I have also a male specimen from Tozan (8500 ft.), September, 1906 (No. 1600 F).

Hydrelia rubrivena, sp. n.

♂. Fore wings brown, tinged with reddish; subbasal line blackish; antemedial line blackish, indistinct, preceded by a still less distinct line; postmedial line black, wavy, indistinct towards dorsum, outwardly edged with red, which colour is extended along the veins; traces of a blackish subterminal line, chiefly towards the costa. Hind wings brown; three dusky, curved, and interrupted lines, all indistinct. Fringes pale brown, preceded by black dots at ends of the veins. Under side whitish; fore wings from base to postmedial line dusky; hind wings with blackish dot at end of cell, and a blackish postmedial line; the latter is slightly serrated and indented opposite cell.

Expanse, 26 millim.

Collection number, 882.

A specimen from Arizan (7300 ft.), September 14th, 1906.

ab. *obscura*, nov.

♂. General colour as in *rubrivena*, but all markings are much obscured and difficult to trace; similar to the type on the under side.

Collection number, 882 A.

One male specimen from Arizan, September 27th, 1906.

THE MACRO-LEPIDOPTERA OF THE WORLD.*

The plan of this great work, which is appearing both in German and in English, is as follows. There are to be four principal parts or sections, dealing respectively with the fauna of the Palæarctic, Indo-Australian, Æthiopian, and American regions, and each part, again, will comprise four volumes, the first, third, and fourth of each series covering the Rhopalocera, Noctuidæ, and Geometridæ, the second the much more heterogeneous residue—most of which have figured as "Bombyces" in the older entomological literature. Thus Dr. Seitz hopes, in sixteen volumes (some of which we fear may prove rather unmanageably bulky), to provide a complete account of the known Macro-Lepidoptera, with figures of nearly all the principal forms.

Numerous of the volumes are in progress, several (especially on the Butterflies) well advanced; while we have before us the completed first volume, the Palæarctic Rhopalocera, bound in two parts, the letterpress and the plates separately, and thus of a convenient size for handling. The only main group on which nothing has yet appeared is the Geometridæ, and we learn that vol. iv. (Palæarctic Geometræ) is now in preparation, will commence to appear at the beginning of 1912, and will be published rapidly.

Any who look for a complete biological or morphological work will, of course, not find it here. Even if the time is ripe for such, it is difficult to conceive of any at present workable plan whereby it could be carried out. At the same time, it is only justice to Dr. Seitz and his numerous collaborators to emphasize the fact that they are providing much more than the

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"illustrated catalogue," which was somewhat slightingly spoken of when the work was first announced a few years ago. Brief descriptions of the earlier stages are included wherever these are known, and the dry descriptive matter is often enlivened by notes on the habits of the imago. Scientifically, too, the names of such contributors as Jordan, Aurivillius, and others are guarantee that we have work of real classificatory value, and their synopses and differentiations should be a real help to advanced students.

The completed volume (vol. i.) will appear to many to be less important than most of those which follow, as we have already so many good text-books and iconographies of the Palæarctic Rhopalocera. On the other hand, the large number of the students of the group justifies an extensive literature, and the present volume by no means duplicates its predecessors, but gives a wider view of the Palæarctic area and much new or newly collected information.

The illustrations are for the most part good, and of practical use for the determination of species. We wish the enterprise continued success.

NOTES AND OBSERVATIONS.

Second International Congress of Entomology.—The Second International Congress of Entomology will be held at Oxford from August 5th to 10th, 1912. Further particulars will be announced shortly.

The President of the Congress is Professor E. B. Poulton, D.Sc., F.R.S.

The Executive Committee proposes to find for Members of the Congress lodgings in the town, or rooms in one or more of the Colleges, at a moderate charge; rooms in the College will be available only for men. The Executive Committee invites an early provisional notice of intention to join the Congress, in order to be able to make the arrangements for the necessary accommodation. The proceedings of the First Congress are in the press and will be published shortly. All communications and enquiries should be addressed to the General Secretary of the Executive Committee, Dr. Malcolm Burr, c/o the Entomological Society of London, 11, Chandos Street, Cavendish Square, London, W.

Abnormal Union of Butterflies.—While collecting in Puszta Peszer on June 12th this year, I captured a specimen of *Argynnis daphne* in copula with a *Melitæa athalia*. The two specimens were transferred from the net into a pill-box and remained united for some considerable time. On examination after they came apart both specimens proved to be males.—N. Charles Rothschild; Arundel House, Kensington Palace Gardens, W.

Note on the Roosting Habits of Heliconius charitonia.—My attention was first drawn to observe the manner of clustering together in groups of this species when asleep, by Bersa, who told me that he noticed a dozen or so every morning at about six a.m., congregated always on the same twig of the same plant (*Phenax hirtus*, "a member of the nettle family"), growing deep down in a gorge, and overhanging the rocky bed of the stream—all apparently, at that early hour, sound asleep. I therefore visited the same spot one evening, between five and six p.m., and found as we had expected, that they had now begun to assemble for the night. I counted eight specimens, clustered closely together on one small twig, all with their long, closed wings hanging downwards—a withered twig it was, covered with brown, prickly seeds, possessed of unusually adhesive tendencies, and it struck me that this was probably the main cause for this twig, and others always more or less dried up, being especially favoured; though of course it also admits of protective suggestions. Bersa said he had always found them in the morning on these very same twigs. When disturbed they flopped sleepily about in the immediate neighbourhood, but soon tried to resettle, invariably rejecting all the green leaves, and returning ultimately to the dried-up dead twigs by preference, most of them selecting the same one as before. —Margaret E. Fountaine, F.E.S.; Bath, Jamaica, October 7th, 1911.

Stridulation in the Pupa of an Ichneumonid.—During the month of June last I noticed that several of the Tortrix larvæ that I beat from oak carried a small external parasitic larva firmly attached to the second and third segments. Some of these parasitised caterpillars I kept in chip boxes, and in the course of a few days the parasitic larvæ, which were then of a pale green colour, and nearly as large as their hosts had been when first attached, had completed their growth and spun thin transparent, papyraceous, white cocoons, with a medial band of a thicker texture. In a state of nature these cocoons are formed within the rolled leaf which has previously been inhabited by the host, and a curious thing about them is that if wetted they turn to a deep brown in colour. As soon as the larvæ had changed to pupæ, I was much surprised to find that they made a very noticeable sound by wriggling in their cocoons. The noise appeared to be produced by the abdomen, and, in the case of the female, the ovipositor, which was curled over the back in the usual way, being scraped against the cocoon, and was distinctly audible at a distance of several yards, so much so that a maid, whose duty it was to clean the room in which these pupæ were kept in a drawer, was much alarmed and distressed, thinking she had heard a "ticking spider" (the local name for the death-watch beetle). The imagines emerged in July, and I at first took them to be the Lissonotid *Phytodictus*, but on submitting a specimen to Mr. Claude Morley, he very kindly pointed out that they were *Phytodictus polyzonias*, Forst. — G. T. Lyle; Brockenhurst.

Lepidoptera of Torquay.—In a list of the moths and butterflies occurring in the Torquay district (Journal of Torquay Nat. Hist. Soc.), Mr. H. Lipton enumerates upwards of five hundred and twenty species and varieties.

Rhopalocera of Cyprus.—Mr. John A. S. Bucknill, in a Supplement to 'English School Magazine,' Easter, 1911, gives a "List of the Butterflies of Cyprus." Sixty-three species are mentioned, and of these about twenty are noted as occurring also in Britain.

THE LEPIDOPTERA OF LINCOLNSHIRE.—Mr. G. W. Mason, of Barton-on-Humber, has published the fourth part of his 'Annotated List of Lepidoptera of Lincolnshire.' This treats of the "Micros," of which about four hundred and eighty-five species are known to occur in the county. The List of Butterflies was published in the 'Lincolnshire Naturalists' Union Transactions' for 1906. Heterocera, Parts i.–iii., appeared in the Transactions for 1907, 1908, and 1909 respectively. Part iv. was published in 1910.

UNUSUAL DATES OF OCCURRENCE AND EMERGENCE OF LEPIDOPTERA IN 1911.—The following records in this connection may be of interest. *Argynnis euphrosyne*, August 17th; *Porthesia similis*, September 20th, two males at light; *Leucania pallens*, September 23rd, in good condition, at sugar. *Dioryctria splendidella*, first appeared June 4th; *Dasycampa rubiginea*, bred from ova on August 20th (of course without artificial heat). Besides these, I may mention the occurrence of a third brood of *Trichoptilus paludum*. This species was on the wing in fresh condition during the second week of June, the first and second weeks of Angust, and again in the second week of September. Specimens of the first and second broods were bred from larvæ found full-grown on May 21st and July 12th respectively; the second brood was by far the most numerous, and the third was by no means rare. *Nemoria viridata* also had a partial third brood. Several imagines were taken on May 27th, and ova obtained from a female captured then gave us larvæ which pupated about July 16th; five pupæ were obtained, from two of which imagines emerged on August 9th and September 7th, respectively, the other three remaining over the winter. Most of these observations are due to my brother, R. J. Champion; they all refer to localities in the south-east of England, chiefly in Surrey.—H. G. CHAMPION; New College, Oxford, October 29th, 1911.

ACHERONTIA ATROPOS IN CORNWALL. — On September 19th a very fine specimen of the above was taken by Mrs. Luke, of Mount Pleasant, Camborne, settled upon her lawn. She very kindly forwarded the insect as an acceptable present to me.—A. J. SPILLER; Godolphin Cross, Helston.

On September 24th two specimens of *A. atropos* came to light in the Lizard district.—B. HAROLD SMITH.

ACHERONTIA ATROPOS IN NORFOLK.—On August 4th I received a full-fed larva of *A. atropos* from Bladeney, Norfolk.—H. M. EDELSTEN; The Elms, Forty Hill, Enfield.

ACHERONTIA ATROPOS IN BERKSHIRE.—I should like to record the capture of *A. atropos* at Wargrave, Berks, by my sister, Miss A. Dolton. It flew to the light in the kitchen, about 7 p.m., on October 6th, and was eventually secured in a cake tin. It is a fine specimen and in very good condition.—H. L. DOLTON; 27, Brunswick Street, Reading, October 12th, 1911.

Sphinx convolvuli in Surrey.—A specimen in fair condition was brought to me by Eric Mackney, the moth having been taken in a shop in Kingston-on-Thames on October 11th last.—W. J. Lucas; Kingston-on-Thames.

Sphinx convolvuli in Worcestershire.—A specimen of *S. convolvuli* was brought me alive and in fairly good condition on September 22nd. The species has been taken here before, but not often. We are far inland, quite the middle of England.—(Rev.) A. Day; The Vicarage, Malvern Link.

Sphinx convolvuli in Bedfordshire.—It may be of interest to note that I had a fine female *S. convolvuli* brought to me on September 19th last. The specimen was quite stiff, and had apparently been dead about a fortnight. It was discovered on a book in an office in Luton, Beds.—L. G. Higgins; Furzedown, Harpenden, Herts.

Sphinx convolvuli in the Isle of Man.—I have just received a specimen of *S. convolvuli* taken alive this September by a friend on the sea coast near Port Erin, Isle of Man. This locality is interesting to record in connection with those mentioned in the 'Entomologist' for August.—E. O. Croft, M.D., F.E.S.; 28, Clarendon Road, Leeds, October 5th, 1911.

Sphinx convolvuli in Hants.—Mr. Cecil Haig has asked me to record the capture of eight specimens of *S. convolvuli*, four males and four females, from August 21st to September 11th, at Exbury, Hants. They were brought to him by a friend who took the moths, which had flown into his house. Other specimens were seen in the garden, but were not taken.—E. S. A. Baynes; 120, Warwick Street, S.W.

Sphinx convolvuli in Isle of Wight.—During the last week in August and the first week of September numbers of *S. convolvuli* were seen hovering around the tobacco plants in our garden at Ryde. They were exceedingly difficult to catch, and I only managed to capture two specimens, one of which came to light in a room.—A. C. Morris; Gibson's Hill, Upper Norwood.

Sphinx convolvuli at Manchester.—On September 5th an example of *S. convolvuli* was captured in a narrow street in Ancoats, Manchester, by one of the juvenile members of the Heyrod Street Lads' Club. This unusual visitor to Ancoats is now preserved in the Club "Museum."—T. A. Coward; Bowdon, Cheshire.

Sphinx convolvuli in North Devon.—Mr. K. Rhodes, of Bowdon, has shown me a specimen of *S. convolvuli*, captured at Woolacombe Bay, North Devon, on August 24th.—A. W. Boyd; The Alton, Altrincham, Cheshire, October 19th, 1911.

Sphinx convolvuli in Surrey.—Two female specimens of *S. convolvuli* were captured at light on August 25th. A clump of *Nicotiana affinis* was growing in the border just below the window, and a male was taken at the flowers on September 1st; other specimens were also noticed at the flowers during the early part of the month.—B. Harold Smith; Edgehill, Warlingham, Surrey.

Sphinx convolvuli reared from Ova to Pupæ.—It may be of interest to record the rearing of *S. convolvuli* larvæ, from ova deposited by a female captured on September 7th; several ova were obtained and the larvæ hatched out on the 15th and 16th. *Convolvulus sepium* was given as food. After each moult, which was of short duration, they fed at an enormous rate, and duly pupated on October 9th, 10th, and 11th.—G. Nobbs; North Lodge, East Cowes, Isle of Wight, October 24th, 1911.

Sphinx convolvuli in Kent.—We wish to record the capture of two specimens of *S. convolvuli* this year. The first of these was netted at about 9 p.m. on September 13th at a bed of petunias, having seen it on some verbenas a quarter of an hour previously. Another was seen on the same petunias the next evening at dusk, and on September 16th we captured one on white *nicotiana* (tobacco plant) at 7.20; we had been watching it for some time in the twilight, hearing the hum of its wings most distinctly as it flew from flower to flower. Both specimens captured are males. We saw a third specimen about a week later, but failed to catch it. A noticeable point was that they entirely disregarded the dark red *nicotiana* blossoms, though they were more plentiful in the garden than the white; this must be either owing to the fact that they are less visible in the darkness, or that, being more highly cultivated than the white, they have less scent or honey, just as the most highly cultivated mignonette has no scent at all.—P. A. and D. A. J. Buxton; Fairhill, Tonbridge.

Sphinx convolvuli and Acherontia atropos in Hampshire.—This is evidently a great year for the larger hawk moths. I have had four specimens of *S. convolvuli* brought me this month, and have seen another flying round one of the electric lamps in the town, while news of a good many more having been taken in the neighbourhood has reached me. A week ago a fresh specimen of *A. atropos* was brought me.—(Rev.) J. E. Tarbat; Farnham, September 27th, 1911.

Sphinx convolvuli at Dovercourt.—This species appears to have been rather common in this neighbourhood this autumn, for I have had five brought to me. The first on August 23rd; one on September 7th; one on September 8th; one on 12th, and the last on September 13th. Two of these were very large and fine, and quite uninjured, but the other three had been so roughly handled that they were unfit for the cabinet.—Gervase F. Mathew; Dovercourt, November 20th, 1911.

Agrotis exclamationis, &c., in September.—In view of the recent record of a second generation of *A. exclamationis* in the 'Entomologist' for October, you may be interested to hear that we took this species at sugar here several times. August 30th (three females, fresh), September 1st (one male), September 6th (one) and September 21st. I also hear of the capture of two specimens in late August near Norwich. *A. segetum* was found in fresh condition at sugar on September 1st and 8th. *Barathra* (*Mamestra*) *brassicæ* occurred quite fresh on August 30th (one), September 1st (two), September 4th and 8th (two). All the above must surely be examples of a second brood emerging in this unusually favourable summer. *Noctua xanthographa* continued in fresh condition till September 4th. It seems probable that some of these specimens belonged to a second brood. Even in a normal year fresh specimens would be over long before the end of August. Unfortunately we were not at home in July, and so cannot say when the species came out first. *Hadena protea* was very abundant at sugar in early September, and a few specimens came to light. We never saw one in 1910.—P. A. and D. A. J. Buxton; Fairhill, Tonbridge.

Agrotis exclamationis in September.—This species is not unknown here in the month of September. I find I have the following records:—September 9th and 26th, 1893, at sugar; September 4th, 1900, at sugar; September 10th, 1906, at sugar.—F. C. Whittle; 7, Marine Avenue, Southend.

Agrotis exclamationis, &c., in August.—*A. exclamationis* occurred in the garden here between August 22nd and 31st this year. I also noted *Hadena oleracea* on August 27th; *Plusia moneta* and *P. chrysitis* on August 19th and 20th respectively. *Hepialus lupulinus* was seen on August 19th.—F. W. J. Jackson; Woodcote End House, Epsom.

Agrotis exclamationis in September.—In the 'Entomologist' for October, 1911, I noticed an Editorial note to the effect that *Agrotis exclamationis* was not usually taken in September. Whether this species always occurs in that month in this particular locality, sheltered as it is to the north by Portsdown Hill, I do not know, as I have no previous experience to judge from, but this season at any rate the second brood was to be taken freely at sugar from the middle of August up to September 10th in perfect condition, the specimens being rather more finely marked and of a more distinct clarety shade on the fore wings than in the first brood. I sugared in my small garden here regularly from August 10th up to the end of September, and the extraordinary abundance of the second brood of many of our common species was most noticeable, especially as I had only been able to take one or two of the earlier brood in June, and in some cases had not noticed the presence of the species at all. The more conspicuous and abundant were, in addition to the above—*Acronycta psi*, one only on August 31st; *Mamestra brassicæ* up to October 10th; *Triphæna pronuba* to October 11th; *Caradrina cubicularis*, *Agrotis puta* and *Agrotis segetum* to the present date; *Hadena suasa* to August 25th; *H. chenopodii* and *H. oleracea* exceedingly abundant to the end of September; *Acidalia imitaria* to September 3rd; *Timandra amataria* to September 6th, and *Eupithecia centaureata* to September 30th; perfect specimens of each were obtained on the dates mentioned, whilst those that extended into the present month have been in great numbers on the ivy, the same remark applying to *Triphæna comes* which has been noticed every month from June onward. A larva of *Agrotis exclamationis* taken on August 9th pupated the next day, the imago emerging on August 19th, thus showing the extraordinarily short duration of the pupal stage in this unusually hot summer. In this connection, however, perhaps the most extraordinary capture was that of *Uropteryx sambucaria* at light on October 13th, in view of the fact that this species passes the winter in the larval stage.—LESLIE H. MOSSE-ROBINSON; Margaret Villa, Porchester, Hants, October 22nd, 1911.

AGROTIS EXCLAMATIONIS IN SEPTEMBER.—Referring to Mr. J. S. Carter's record of the capture of three specimens of *A. exclamationis* in September and the Editorial note on the same, in the 'Entomologist' for October, perhaps it is worth mention that I found this species common at sugar on the Devonshire coast in September. Furthermore, I took a long series at sugar a few years ago at Shanklin, Isle of Wight, during the month of September, under the impression that the species was *A. corticea.* I still have this series in my cabinet. They are smaller, somewhat paler, and more distinctly marked than the first brood. It seems probable that the species is normally double-brooded, at any rate on the South Coast. I cannot recall the capture of the species in the Midlands during September or October.—(Dr.) BECKWITH WHITEHOUSE; 52, Newhall Street, Birmingham.

AGROTIS EXCLAMATIONIS AND MAMESTRA BRASSICÆ IN SEPTEMBER.—With reference to Mr. Carter's note in the October number of the 'Entomologist,' it may be of interest to mention that fresh specimens of *Agrotis exclamationis* came to sugar in my garden here on September 7th and 8th. Throughout September *Mamestra brassicæ* appeared at sugar in some numbers, and one was seen at ivy-bloom on October 16th.—A. R. KIDNER; Swinney Garth, Hatherley Crescent, Sidcup, Kent.

MAMESTRA TRIFOLII: THIRD GENERATION.—*M. trifolii* has been very abundant here this season. A female taken early in August laid a batch of ova. The larvæ fed up rapidly and the moths are now emerging—a third generation.—H. M. EDELSTEN; Forty Hill, Enfield, October 3rd, 1911.

LAPHYGMA EXIGUA IN CORNWALL.—On September 20th last a specimen of *L. exigua* came to light in the Lizard district.—B. HAROLD SMITH.

EPHYRA PENDULARIA var. SUBROSEATA, Woodforde, IN LINCOLNSHIRE.—I have bred a number of this variety from ova laid by a typical female taken in a wood near Lincoln in June, 1910. The majority of those which emerged were this form.—G. W. MASON; Barton-on-Humber.

COLIAS EDUSA IN WEST CORNWALL.—In October I saw a male *Colias edusa* in the grounds of Penrose (near Porthleven); another was seen on the way to Penrose by the cliffs from Porthleven, and another (a few days earlier) on the towans near Hayle. I had been staying in West Cornwall from September 1st but had seen no *C. edusa* until the first week in October. It was just the same, I remember, when I was staying in the same district a few years ago; but then in the first ten days of October I saw quite a considerable number of *C. edusa.*—HAROLD HODGE; 9, Highbury Place, London, N.

COLIAS EDUSA IN CHESHIRE.—On September 24th I took a specimen of *Colias edusa* at Parkgate in the Wirral peninsula of Chesire.—A. W. BOYD; The Alton, Altrincham, Cheshire, October 19th, 1911.

COLIAS EDUSA IN CORNWALL.—A few specimens were seen in the Lizard district during September, but they only appeared one at a time.—B. HAROLD SMITH; Warlingham, Surrey.

COLIAS HYALE AT DARTFORD.—I captured five male specimens on September 2nd. No example of the female was seen. — A. J. EXETER; Southern Hospital, Dartford.

COLIAS EDUSA AND COLIAS HYALE AT COLCHESTER.—On September 25th I captured a fine, quite fresh, male specimen of *C. edusa* in a lucerne field here; the following day, while my son was intent on collecting larvæ of *Cryptoblaptes bistrigella*, a male *C. hyale* flew past him.—W. H. HARWOOD; Colchester.

COLIAS HYALE IN ESSEX.—I took a specimen of *C, hyale* at Dunmow, on October 2nd, flying over some lucerne.—H. M. EDELSTEN; Forty Hill, Enfield.

COLIAS HYALE IN ESSEX.—The only *Colias* I have seen here this year is one male of *C. hyale* which my son caught with his straw hat on August 30th.—EDWARD A. FITCH; Maldon.

MACROGLOSSA STELLATARUM AND POLIA XANTHOMISTA, &c., IN CORNWALL.—This species abounded in the Lizard district, in September. I was much interested in watching one hawking up and down the lee side of some tamarisk bushes at 6.30 p.m. in a strong south-west gale, with rain and sea fog. At sugar, *P. xanthomista* and *P. flavicincta*, *E. nigra* and *A. australis*. Some nice black varieties of the latter turned up in fair abundance, also several examples of second broods of *A. exclamationis*.—B. HAROLD SMITH; Warlingham, Surrey, October 10th, 1911.

MACROGLOSSA STELLATARUM IN WEST CORNWALL.—This moth was very common about Hayle in September and in the earlier days of October this year. There were other twos and threes together in the conservatory in the house where I was staying. One was found in a bedroom as though it was going to hibernate.—HAROLD HODGE.

STERRHA SACRARIA IN CORNWALL.—On September 8th a female *S. sacraria* was captured flying over rough grass, but though kept for eggs refused to lay. Careful searching did not produce any more, though a friend took a male in the same place a night or two before. —B. HAROLD SMITH.

HELIOTHIS ARMIGERA IN THE ISLE OF WIGHT.—When sugaring with the Rev. J. E. Tarbat at Freshwater, on September 11th, we took a fine *H. armigera*.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

PERIZOMA (EMMELESIA) TÆNIATA IN NORTH DEVON.—A stay at Lynton, North Devon, during the first fortnight in July, disappointing from an entomological point of view, was redeemed by the capture of about thirty specimens of *P. tæniata*. They were taken just above Watersmeet, and I have since seen that the locality is given in Mr.

R. South's 'Moths of the British Isles.' It is satisfactory to find that the insect survives in this its most southern locality. The unworkable nature of the ground gives hope that it will continue to do so. The specimens are of the pale form, with a moderately dark band.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

TIME OF APPEARANCE OF STILBIA ANOMALA. — Most authorities give August and September for *S. anomala*, others early in August or even the end of July. Here we take the insect in great profusion by searching the grasses on the edge of a common, flanked by a ditch and hedge surrounding a pinewood. None are taken more than a few yards from this hedge. In normal years not a specimen is to be had before the first week in September, and then only the males, the females following about a week later. In this year, when all species were early, the following dates may be of interest:—August 15th, males just beginning to emerge; August 23rd, males in profusion, only one female taken; August 30th, males comparatively scarce, females in almost equal numbers, but evidently out a day or two. The moths soon get damaged, and it is easy to detect a freshly emerged specimen. The larvæ are found in great numbers on the same spot in the early spring.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

XANTHIA OCELLARIS NEAR DOWNHAM MARKET. — On September 6th last I had the good fortune to take a male specimen of *X. ocellaris* a few miles from here.—ROBT. S. SMITH, Jun.; The Laurels, Downham Market.

CHÆROCAMPA (EUMORPHA) ELPENOR IN NOVEMBER.—On November 7th my brother sent me a specimen of *C. elpenor* which had been captured in a shop. This seems to be an unusually late date.—ROBT. S. SMITH, Jun.

SPILOSOMA LUBRICIPEDA AND PORTHESIA SIMILIS IN SEPTEMBER.—On September 26th I took a male specimen of *S. lubricipeda* and two males of *P. similis* off lamps.—DOUGLAS H. BUTLER; Hayling House, Reading.

ARCTIA CAIA IN OCTOBER.—A male specimen of *A. caia* was brought to me on October 8th last. The moth had only just emerged from the pupa; in fact, it completed the drying of its wings after I received it.—A. J. EXETER; Southern Hospital, Dartford, Kent.

PHRYXUS LIVORNICA IN CORNWALL.—Two specimens of *P. livornica* came to light on September 10th.—B. HAROLD SMITH; Warlingham, Surrey.

PHRYXUS LIVORNICA IN EAST DEVON.—A splendid example of *P. livornica* was brought me early in September, captured in a friend's greenhouse. It was in perfect order, save for a rub on the thorax, due to the small box in which it was packed, and had evidently only just emerged.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

PLUSIA NI IN CORNWALL.—On September 11th, when staying in the Lizard district, a specimen of *P. ni* was captured at flowers of Virginia stock.—B. HAROLD SMITH; Warlingham, Surrey.

PYRAMEIS ATALANTA, ab.—Referring to Mr. A. W. Lynn's note in 'Entomologist' for November, asking for previous records of the above ab., I beg to state that I have a similar one in my collection, captured in Guildford, Surrey, and exhibited at the South London Natural History Society (see 'Entomologist,' vol. xxxix. p. 111).—W. E. BUTLER; Hayling House, Reading.

SECOND BROOD OF BOARMIA REPANDATA.—Larvæ from the usual summer brood of *B. repandata* fed up and pupated, and produced perfect insects during September and October. One of the moths, a male, is a black specimen. All were strongly and beautifully marked, and some were intermediate between strongly marked and black—the black showing on the basal half of the wings. The parents of the first brood were reared from Delamere Forest larvæ, and I have caterpillars now from eggs laid by females of the second brood of moths.—J. THOMPSON; 20, South View, Chester.

CATOCALA NUPTA, ab.—At the end of August last a specimen of *C. nupta*, in which the usual reddish colour of the hind wings was replaced by dusky brown, came to light.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

CHRYSOPHANUS PHLÆAS, ab.—*C. phlæas* was in great numbers near the Lizard, Cornwall, last September. I took one female which had the right fore wing mainly white instead of the usual copper colour.—B. HAROLD SMITH.

DRAGONFLIES BRED IN 1911.—I have bred this year *Æschna grandis*, *Æ. cyanea*, *Ischnura elegans*, *Agrion puella*, *Erythromma naias*, *Pyrrhosoma nymphula*. I did not find it a good season for nymphs; a week-end at Wicken Fen at Whitsuntide produced but a few; it was of course rather late for them. *Brachytron pratense* was flying in fair numbers.—HAROLD HODGE.

NOTES ON DURHAM LEPIDOPTERA.—*Eupithecia innotata*. I obtained a few larvæ last year in Durham from scabious and rose, that I took to be *E. fraxinata*. However, when the insects emerged this year they proved to be *E. innotata*. My friend, Mr. Johnson, of Gateshead, deserves the credit for detecting these larvæ on scabious, for he took a fair number in 1909 from which no moths were reared the following year. These food-plants seem unusual, but the larvæ from ova laid by bred females fed readily on a potted plant of *Artemisia absinthium* I had ready for them. The females pair readily enough, but they have a decided objection to depositing their ova. I secured about two dozen and have nine pupæ. A point worthy of note is that the insect is double-brooded in captivity, although perhaps the present season has not been suitable for giving one a general rule. I was unable to go for wild larvæ this year.—*Oporabia autumnata*. I have discovered this species in tolerable abundance in a mixed birch and alder wood at Birtley, North Durham. The forms were quite typical.—*O. filigrammaria*. This too occurs not uncommonly at Birtley. One locality is on heather, but what it feeds on at the other, unless it is elder or hawthorn, is a mystery to me.—*O. christyi*. One female on a telegraph pole at Birtley.—*Hydriomene ruberata*.—Very common indeed at Birtley. Nearly all are of the red form, but the type occurs and so does a uniformly black aberration with markings practically obscured. This form is hereby named *aterrima*.—*H. impluviata*. Nearly all the specimens are black (ab. et var. *nigerrima*, mihi), although those occurring in one swamp have a pale spot on the dorsum where the central fascia normally ends (ab. *unipunctata*).—*Selenia tetralunaria*. I beat a single larva from birch which yielded a male of this species; this provides the first Durham record.—*Vanessa io*. I caught one in August on a tansy head. This is the first taken in Durham for many years.—J. Harrison; 181, Abingdon Road, Middlesborough.

Entomological Club.—A meeting was held at the Savage Club, Adelphi Terrace, W.C., on Nov. 16th, 1911, Mr. H. Rowland-Brown in the chair. Other members present were Mr. R. Adkin and Mr. Horace St. John Donisthorpe; Honorary Members: Mr. A. H. Jones and Mr. A. Sich. Mr. Adkin proposed that Mr. Sich, an Honorary Member, be elected a Member of the Club; this was seconded by Mr. Rowland-Brown. Ballot to be taken at next meeting. On the proposition of Mr. Donisthorpe, seconded by Mr. Adkin, Dr. Malcolm Burr was nominated an Honorary Member of the Club. This being the first meeting of the Club since the death of Mr. G. H. Verrall, the Chairman, referring to the great loss the Club has sustained, testified to the many excellent qualities of the late member. It was largely due to Mr. Verrall's exertions that the Club was revivified at a time when dissolution seemed inevitable. The other Members present—Mr. Adkin and Mr. Donisthorpe; also Dr. Dixey and Mr. Sich—offered tributes to the memory of one who had taken such deep interest in the welfare of the Club, and was largely instrumental in establishing it in the secure position it holds in this the eighty-fifth year of its existence.—Richard South, *Hon. Sec.*

SOCIETIES.

Entomological Society of London.—*Wednesday, October 4th*, 1911.—The Rev. F. D. Morice, President, in the chair.—Mr. C. B. Williams, of 20, Slatey Road, Birkenhead, was elected a Fellow of the Society.—The President proposed a vote of condolence with the relatives of the late Mr. Verrall, which was seconded by Professor Poulton.—A vote of condolence with the relatives of the late Mr. Albert Harrison was proposed by the Rev. G. Wheeler, and seconded by Mr. W. J. Kaye; and a similar vote in the case of Dr. Scudder was proposed by Mr. Champion, and seconded by Professor Poulton.—Mr. Donisthorpe exhibited specimens (males and workers) of *Formica pratensis*, De G. (*congerens*, Nyl.), taken at Rannoch in June; also workers of *F. sanguinea* captured in the same region, a new locality for it; and females and workers of a new race of *Formica rufa*, also from Rannoch.—Mr. Bethune-Baker, a specimen of *Melanargia galatea* var. *lugens*, taken at Digne in July last. It is an entirely dark brown (almost black) form, with no white markings, though the ordinary markings are just traceable in a slightly lighter shade. Commander Walker observed that a similar example had also been taken in

England.—Mr. Norman H. Joy, a remarkable specimen of *Oxytelus* taken at Tresco, Scilly Isles, April, 1908. In many respects it is quite intermediate in character between *O. sculptus* and *O. laqueatus*, Marsh. It is probably a species new to science, but may possibly be a hybrid of these two species. He also showed *Liodes stenocoryphe*, Joy, male, taken by Mr. W. E. Sharp, at Forres, in 1910, as well as its near allies for comparison, *viz. L. picea*, Ill., taken by Mr. Tomlin and Mr. Joy at Dalwhinnie, Inverness-shire, in September, when the larva was also found feeding on a small underground fungus; *L. dubia*, King, and its various varieties, and *L. algirica*, Rye, almost certainly only another variety of this species.—Mr. W. C. Crawley, a mixed colony of *Lasius umbratus* and *L. niger*. This colony consists of a female *L. umbratus*, which was accepted in 1908 by a queenless colony of *L. niger*. During 1909 and 1910 only *niger* workers came to maturity in the nest; those, therefore, that hatched in 1910 must have been from parthenogenetic eggs laid by the *niger* workers. Over a dozen of these latter were dissected, and found to contain no *receptaculum seminis*.—Mr. Donisthorpe commented on the interest of Mr. Crawley's experience, remarking that while it had formerly been supposed that parthenogenetically laid ova produced only males, Mr. Crawley had shown, and proved by dissection, that workers were capable of parthenogenetically producing workers. The President observed that parthenogenesis was not unusual in sawflies, and mentioned that in *Crœsus varus*, which had been founded on a male specimen, the original specimen was the only male known. Dr. M. Burr remarked that the common "stick insect" is largely parthenogenetic, and has been bred parthenogenetically for more than twelve consecutive generations.—Mr. E. A. Cockayne exhibited a melanic specimen of *Lithosia deplana*, male, taken in Surrey last July.—Mr. J. Platt Barrett, some species of Sicilian butterflies taken this year, in contrast with corresponding British species, viz. *Euchloë cardamines* and *E. damone*, *Gonepteryx rhamni*, and *G. cleopatra*, *Hipparchia semele*, and var. *algirica*. Small southern forms were also exhibited of *E. cardamines* and *Leptosia sinapis*.—Dr. Chapman, living larvæ of *Albulina pheretes*, and a living imago of *Latiorina orbitulus*; and observed that his former suggestion that *A. pheretes* had probably a larva without a honey gland was incorrect. The larva of *A. pheretes* possesses a honey gland and fans. Owing probably to the warm weather during August and September, three of the larvæ reached the last instar, and he was therefore able to exhibit the larva in the third, fourth, and fifth (or last) instars. *L. orbitulus* also afforded "forward" larvæ this season, and the living butterfly of this autumnal emergence, which was exhibited, left the pupa on October 2nd; but *Vacciniina optilete*, without exception, stopped at the third or hybernating instar.—Mr. J. H. Durrant, two new British species of *Rhyacionia*, Hb. (= *Retinia*, Gn.; *Evetria* Hb. Meyr.), viz. *Rhyacionia purdeyi*, sp. n., taken among Scots firs at Folkestone at the end of July, 1911, by Mr. W. Purdey, a very distinct species intermediate between *sylvestrana*, Crt. and *duplana*, Hb.; and *R. logæa*, sp. n., from Forres, Scotland (W. Salvage and H. McArthur), closely allied to *duplana*, Hb. and *posticana*, Ztst. The type male of this new species is the specimen figured as *duplana* by Barrett ('British Lepidoptera,' xi. pl. 476, fig. 2); the female is similar but smaller than the male and somewhat more distinctly marked. *R. duplana*, Hb. male and female, as also both sexes of *R. posticana*, were exhibited for comparison. — Mr. J. H. Durrant also exhibited eighteen specimens of *Colias* taken by himself in a field of lucerne at Barcote, near Farringdon, Berks, from September 4th to 10th, 1892. These comprised both *hyale* (two) and *edusa* (fourteen) and two aberrations of the latter, one of a very light orange colour (ab. *helicina*) and the other a fine ab. *helice*. All the specimens of *C. edusa* were of a yellowish orange tint.—Mr. W. J. Lucas, specimens of *Sympetrum fonscolombii*, a species very seldom taken in Britain and quite new to the Forest, taken by him at a pond in the south of the New Forest, on August 4th, 7th, 8th, 25th, and 29th, all but one being males. *S. fonscolombii* is usually considered to be a casual visitor only to our shores, but this case seems rather to throw doubt on this supposition, for the date is a late one. The insects on the first visit to the pond were very fresh; one was a female, which looked even fresher than the males, and females seem seldom to join migratory swarms. — Dr. F. A. Dixey read a letter received by him from Mr. E. A. Agar, of Dominica, West Indies, on the subject of the separation of the sexes of *Hypolimnas misippus*, the writer remarking that in that island, although haunting similar localities, the female remains on the coast while the male is to be met with some distance inland. The former is scarcely ever to be seen in company with the male of its own species, although it flies with *Danaida plexippus*, of which it is a mimic. Dr. Dixey remarked that it was a common experience that one sex of a butterfly at any given time was more in evidence than the other. Mr. Millar, of Durban, had drawn his attention to the fact that, speaking generally, the males were more apt to be on the wing during the morning, and the females in the later hours of the day. Dr. Longstaff observed that in North Africa certain species of *Teracolus* gave abundance of males in the morning, whilst in the afternoon the females predominated greatly. — Professor Poulton exhibited the cocoon of the Hypsid moth *Deilemera antinorii*, Oberth., which Mr. W. A. Lamborn had intended to exhibit on June 7th last. He also exhibited examples from three of the all-female broods obtained by Mr. W. A. Lamborn, chosen because they prove that the unisexual batches are not necessarily associated with either of the forms of *encedon* in the locality, one brood being all *lycia*, another all *encedon*, while the third was as nearly as possibly half and half (23 to 24). Professor Poulton also exhibited a series of eight *A. alciope* and five *A. aurivillii* bred in the present year by Dr. G. D. H. Carpenter from thirteen small larvæ found on a single leaf of the food-plant on Damba Island, in the Victoria Nyanza, to the east of Entebbe. The result entirely confirmed the conclusions of Mr. Eltringham and Dr. Jordan that *A. aurivillii* is the female of *A. alciope*.—The Rev. G. Wheeler exhibited some living workers of a small ant, identified by Mr. Donisthorpe as *Monomorium pharaonis*, imported from Madeira, and now settled in England, together with several butterflies whose bodies and heads had been devoured by them while in the setting box. He observed that these insects had all been killed in the cyanide bottle, whilst others in the same setting box, which had been injected with oxalic acid, were left untouched.—The President said that about the beginning of July this year he had noticed, while collecting near El Guerrah, the junction for Constantine, Biskra and Alger, both sexes of the yellow and black *Leucospis gigas* and of another red and black *Leucospis*, flying in great numbers round a cairn of stones on the top of a hill, and suggested that the common instinct to seek high places might provide a meeting-place for the sexes.—Commander Walker read the following papers:—(1) "Report on a Collection of Bombyliinæ (Diptera) from Central Africa, with Descriptions of New Species," by Professor Mario Bezzi, Turin, Italy (communicated by G. A. K. Marshall, F.E.S.). (2) "An Enumeration of the Rhynchota collected during the Expedition of the British Ornithologists' Union to Central Dutch New Guinea," by W. L. Distant. (3) "*Œstridæ cavicolæ*," by Ivan E. Middleton, F.E.S., of Serampore, India.—George Wheeler, M.A., *Hon. Sec.*

City of London Entomological Society. — *October 17th*, 1911. — *Abraxas grossulariata*, abs. Rev. C. R. N. Burrows exhibited a number of aberrant examples, mostly bred from larvæ collected at Macclesfield and Wallasey; these included a specimen of ab. *lacticolor* (Raynor) with basal area of superiors suffused with black, also ab. *fulvapicata* (Raynor) and others with increase of black marking.—Zygænids. Mr. E. A. Cockayne a number of five and six spotted specimens of somewhat doubtful identity from a colony found in a field in Berkshire, which produced both forms in June, 1911.—*Peronea variegana*. Mr. J. E. Gardner a very variable series, mostly collected in a garden at Clapton.—*Œdamatophorus lithodactylus*. Mr. G. H. Heath a series from S. Wales showing colour variation parallel to that occurring in *Pterophorus monodactylus*. —*Smerinthus populi*. Mr. L. W. Newman a long series bred ex selected Bexley parents, ranging from pink flushed forms to pale cream coloured, and including two hermaphrodites, of which ten were bred ex one thousand pupæ.—*Angerona prunaria*: effect of environment. Mr. C. P. Pickett some half dozen series, mostly from same brood, reared ab ovo under different coloured muslins; the series as shown displayed marked differences in coloration which the exhibitor attributed to the varying environment.—*Cænonympha pamphilus*, ab. Mr. J. Riches, a dingy brown specimen with pale patch in marginal area of inferiors, Lewes, August, 1911.—*Colias edusa*, vars. Mr. A. J. Willsdon specimens from Plymouth and Torquay, 1900, including females without usual yellow patches on black margin of superiors, and the lemon coloured form of var. *helice*.—Mr. Willsdon recalled having captured a freshly emerged *C. hyale* early in June of the following year.—*Colias hyale*. Mr. L. W. Newman reported that males taken in September and kept for ova showed no inclination to lay, and seemed disposed to hybernate.—*Vanessa cardui* and *Sphinx convolvuli*: short larval period. Mr. Newman recorded that by feeding up larvæ in a hothouse he had secured the completion of this stage in three weeks for the former and twenty-six days for the latter.—S. J. Bell, *Hon. Sec.*

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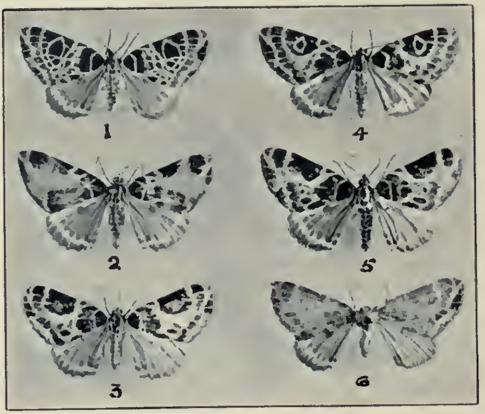
The Entomologist, January, 1912. Plate I.



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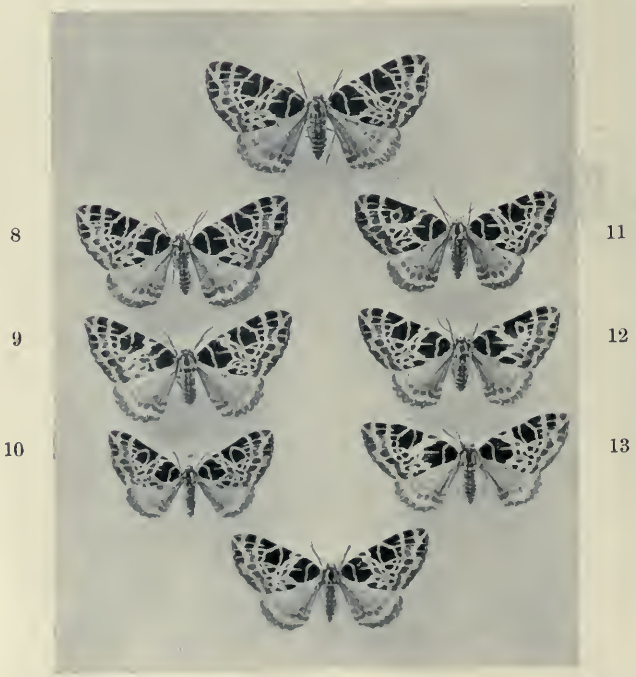

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Aberrations of Eustroma reticulata and Zonosoma linearia.

THE ENTOMOLOGIST

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EDITORIAL.

WITH very great pleasure we have to announce that Mr. CHARLES JOSEPH GAHAN has been good enough to join the Reference Committee of this Journal. As an authority on Coleoptera, Mr. Gahan is so widely known that his association with the 'Entomologist' will enlarge its field of operation, and so enhance its usefulness as a "Journal of General Entomology."

As there appears to be some misconception about the date of publication of the first volume of the 'Entomologist,' we may mention that No. 1 of Vol. I. was issued on November 1st, 1840, and No. 26—concluding the volume—in December, 1842.

In 1843, and for some twenty years afterwards, the 'Entomologist' was merged in the 'Zoologist,' but in May, 1864, it was revived, and has continued to appear month by month from that date up to the present time. It should be stated that the first six volumes were double—that is, they each comprised the numbers for two years.

ON THE VARIATION OF *EUSTROMA RETICULATA* (SCHIFF.)

By LOUIS B. PROUT, F.E.S.

(PLATE I.)

MY little note on Mr. Nurse's interesting aberration of *Eustroma reticulata* (Entom. xliv. p. 59) seems to have attracted some attention, and has been instrumental in bringing me some really astonishing information as to the occasional capacity for variation of this usually constant species.

In February Mr. Frank Littlewood, of Kendal, sent me a very fine photograph of the pick of a long series bred by himself and Mr. George Holmes, of Kendal, and it is only extreme pressure of work that has prevented my calling attention to them earlier. Then more recently Mr. B. H. Crabtree, of Levenshulme, Manchester, followed with a photograph of some extraordinary forms bred by Mr. H. Murray, of Carnforth, in 1893, and now in Mr. Crabtree's collection—probably some of the most remarkable aberrations of the species in existence. Our Editor has wisely made arrangements for all to be presented to readers of 'The Entomologist' together, and I believe they furnish a new chapter in the written history of *E. reticulata.*

To begin with Mr. Littlewood's photograph as the first which reached me—although chronologically his specimens are the younger. Since 1904, when (after an interval of eight years) *E. reticulata* was rediscovered through the energy of the Rev. A. M. Moss, Mr. Littlewood, Mr. Holmes and others have profited by his generosity in putting them into the way of working for it, and have bred it in good numbers. I may perhaps be allowed to say in parenthesis that Mr. Littlewood has accumulated some very interesting notes on the early stages, which I hope he will be induced to publish at no very distant date. The specimens figured are, I understand, the pick of the breeding of the years which have supervened on the said rediscovery. Mr. Littlewood and Mr. Crabtree both agree with my remarks as to the *general* constancy of the species.

Figs. 7 and 14 represent the two ordinary forms (both about equally common), and show that the normal range of variation is restricted to a difference in the degree of approximation of the antemedian and postmedian lines on the costa, as mentioned in my note above referred to. The other specimens are all aberrant in some way, some strikingly so. The frequency of asymmetry is a noteworthy feature; it will be recollected that the two most striking aberrations previously described (Mr. Nurse's and Mr. Webb's) are both asymmetrical. In Fig. 8 the asymmetry, though slight, is curious, probably even unique; on the right fore wing the first median (vein 3) is only white as far as the postmedian line instead of to the termen. Fig. 9 speaks for itself; the abnormality, it will be noticed, is confined to the left fore wing. Fig. 10 I take to be roughly the ab. *ovulata*, Borgmann, though his example may probably have had the central mark more nearly oval—more as in Mr. Crabtree's Fig. 4. Figs. 11 and 12 are a noteworthy asymmetrical pair, each with one wing of the *ovulata* form. In Fig. 13 the antemedian double white line is broadly coalescent on both wings.

Still more strange are some of Mr. Crabtree's aberrations, all of which, however, are full sized and well formed, so that one cannot attribute them to arrested development. Fig. 4 is a fine extreme example of ab. *ovulata.* Nos. 2, 3, and 5, though differing widely *inter se*, may be considered as having something in common in their general "make-up," illustrating in varying degree the potentialities of "concentration" of the dark colour into costal blotch or blotches, of which I spoke in discussing Mr. Nurse's and Mr. Webb's aberrations. As this phase of variation now proves to be recurrent, and not entirely confined to asymmetrical manifestation, I think it convenient to give it a special name, ab. *costimacula*, nov. ab., and designate Fig. 5 the type thereof. Those who believe in naming *every* differentiable form may like to add names for Figs. 2 and 3, but I prefer to cover by the name all forms which have a dark blotch in the middle of the costa followed by a suffusion of white in the middle of the wing. The distinctions between the three specimens in question are well shown in the figures: No. 2, with its very extended pale area and the blurred inner marginal markings, is the most extraordinary; Fig. 5 is on the *right* wing intermediate between *costimacula* and *ovulata*.

As regards Fig. 6, it is the only example yet known in which the ground-colour, as well as the scheme of markings, has materially changed. The parts which are ordinarily brown (and which, in spite of their reduction, I still regard as theoretically the "ground-colour") are ochreous, only a shade darker than in *Perizoma flavofasciata* (*decolorata*), while the white parts are duller white than is typical. The general scheme somewhat suggests a nebulous ab. *costimacula*, vaguely akin to that in Fig. 5.

A NEW ABERRATION OF *ZONOSOMA LINEARIA*.

By Louis B. Prout, F.E.S.

The very interesting aberration of *Zonosoma linearia* figured (Plate I., fig. A) was taken by my friend, Mr. D. P. Betts, in Epping Forest, on June 5th, 1908, and is now in Mr. South's collection. As is well known, this species varies a good deal in the precise position and thickness of the median line (or shade), and I myself have one pretty specimen in which it is thickened just as in Mr. Betts's. But what gives to the new aberration its distinctive charm is that the entire space between this line and the postmedian on both wings is suffused with smoky, resulting in the formation of a definite postmedian band, which is faithfully brought out in the figure. The under side shows the same peculiarity, though more faintly. The only specimen previously known to me which could possibly be described as "banded" is that figured by Barrett on Plate 329, fig. 1c, of his 'Lepidoptera of the British Islands,' in which the dark shading that accompanies the median line is *proximal*, not distal. On the other hand, it is of interest to note that a specimen of the allied *Z. punctaria*, which was sold in the collection of the Rev. G. H. Raynor (bred from Colchester), shows a parallel variation to Mr. Betts's *linearia*, and Barrett figures one or two aberrations of *punctaria* beginning to approach it; while a very similar scheme is normal in *annulata*, and is well known among other branches of the Acidaliinæ—*Ptychopoda aversata, deversaria, &c.* Although I do not consider it always expedient to give special names to single aberrations, the present is sufficiently striking and definite to warrant it, and I therefore christen it *Zonosoma linearia* ab. *fasciata*, nov. ab.

REDISCOVERY OF THE BRACONID *METEORUS VEXATOR* (HAL.), WITH A DESCRIPTION OF THE MALE.

By Claude Morley, F.Z.S., &c.

In his "Essay on Parasitic Hymenoptera" in the old Ent. Mag. (1836, p. 33), A. H. Haliday describes a new species, *Perilitus vexator*, in the female sex only—"Habitat cum præcedentibus rarus" = "Habitat in nemoribus passim frequens. Femina, locis fungiferis autumno." This duly appeared, with no addition, in the Rev. T. A. Marshall's 1872 Catalogue of British Hymenoptera, and the original description was reproduced by the same author in his Monograph of British Braconidæ (Trans. Ent. Soc. 1887), with that of its supposititious male. Both sexual descriptions were copied in André's Spp. Hym. d'Europ. 1891, p. 86, with the remark: "J'ai ajouté ce qui concerne le ♂ d'après un mauvais exemplaire de ma collection; pourtant la réunion des sexes ne parait pas incertaine, à cause de la grandeur exceptionnelle du stigma." In Entom. 1908, p. 125, I gave a table of British *Meteorus* species, assigning *M. vexator* a position based upon its description alone. This is all we knew of the insect—one or more Irish females and a doubtfully associated male.

From a black, hemispherical fungus — almost certainly *Stromatosphæria concentrica*—Mr. J. H. Keys recently sent me from Plymouth two female *M. vexator*, which were bred along with a lot of the clavicorn beetle, *Diphyllus lunatus*, Fab., during August, 1911; no other host or parasite emerged from the fungus, which constitutes conclusive evidence of parasitic association. I at once enquired whether no males were also raised, and Mr. Keys has kindly presented me with the only one bred: in all six females and one male *Meteorus* appeared among numbers of the beetle.

The true male differs from that described by Marshall in having the antennæ no longer than the body, of twenty-six joints, with the basal half dozen ferruginous; metathorax nearly horizontal to its transcarina, which in both sexes is centrally interrupted by a laterally carinate longitudinal area, and then abruptly declived; on either side of this central area the metanotum is not smooth, but finely shagreened, in both sexes; the wings are even less clouded than those of the female, with costa piceous but nervures testaceous; the stigma is not unicolorous but, exactly as in the female, large and nigrescent piceous with its basal third pure white (= "stigmate latissimo, fusco puncto pallido"—Hal.); the second cubital cell is subparallel-sided and neither triangular nor constricted towards the radial nervure; abdomen longer than thorax. Length, $2\frac{7}{8}$ mm.

The insect is closely allied to *Meteorus obfuscatus*, so frequently bred from the heteromerous beetle, *Orchesia micans*, in dry Boleti on elm and other large trees.

A SUPPLEMENTARY NOTE ON HESPERIID CLASSIFICATION.

By H. Rowland-Brown, M.A., F.E.S.

The 'Entomologist,' vol. xliii. pp. 306–9, contains "A Note on the New Classification of certain Hesperiid Butterflies," relative to the researches of Dr. J. L. Reverdin and M. Charles Oberthür, in which, *inter alia*, I drew attention to the difficulty of separating the *malvæ-fritillum* forms. Dr. Reverdin has now most kindly furnished me with an extract from the 'Bulletin de la Soc. lépid. de Genève' (vol. ii. fasc. 2, August, 1911), in which he gives the results of his completed investigations on this particular subject.

A close examination of long series leads him to the conclusion that, *superficially*, *Hesperia malvæ*, and the insect which we have known hitherto as *H. fritillum*, Rambur, are practically inseparable. It is only when we come to compare the male appendages that we are conscious of a complete specific difference; but there are one or two points also of structure and habit, which, pending a complete life-history of *fritillum*, Rbr., may assist us to differentiate these perplexing little butterflies. I take the liberty, therefore, to epitomize Dr. Reverdin's several experiments; but, as a preliminary, repeat what I have already explained in my paper on the species met with by me in the Basses-Pyrénées (Entom. vol. xliv. p. 335), that *fritillum*, Rbr., is henceforth to be known as *malvoides*, Elwes and Edwards (*cf.* "A Revision of the Oriental Hesperidæ," Trans. Zool. Soc. xiv. 1898):—

Size: *Malvoides* ordinarily larger than *malvæ* (but not invariably).
Shape of wings: Fore wings of *malvoides* more pointed, and relatively less broad; *malvæ* appears more compact (*ramassé*).

Coloration: *Malvæ* darker; and the white markings, therefore, shown up in stronger relief on the ground colour; in *malvoides*, the general tint rather brownish than actually black; the white spots contrasting less vigorously. (Examples must be quite fresh to demonstrate this difference.) This is due to the hairs which cover the wings being somewhat lighter and whiter in *malvoides*, which is also more abundantly provided with them than *malvæ*.

Fore wings, upper side: No palpable difference in the distribution scheme of the white spots forming the irregular Y in the middle of the wing; but the row of small ante-marginal spots, very clearly defined *as a rule* in *malvæ*, absent in *malvoides*, or reduced to a few atoms; instead of the spots traces of feeble brownish, lighter than the ground colour.

Hind wings, upper side: Differences even less constant. Usually the median band of white spots with denticulations turned outwards is more extended in *malvæ*.

Fore wings, under side: In *malvoides* the costa, and a thin "piping" the length of the outer margin immediately inside the fringe, ochreous *pale yellow*; in *malvæ* more or less dirty *white*.

Hind wings, under side: *Normal* colour in *malvæ* greyish, in *malvoides* rather yellowish; median band of spots *more often* carried through unbroken from one margin to the other in *malvoides*; in *malvæ almost* invariably broken at the back of the large spot. In very fresh examples pearly reflections of the white spots more pronounced in *malvoides*. Inner margin in *malvæ* usually greyish, or blackish normally; in *malvoides* whitish or yellowish. Not constant. Black spot in line with the anal angle more obvious in *malvoides*. Tiny black spot in white spot just beyond anal angle fails or almost disappears less frequently in *malvoides* than in *malvæ*.

Nervures: *Usual* colouring hind wings, either yellow or reddish yellow in *malvoides*; whitish, or of a less pronounced yellow, in *malvæ*.

Antennæ: The club in *malvoides* yellow or tawny, and *almost* constant *; in *malvæ* brown or black *almost* without exception.

Palpi: In *malvoides*, seen from below, sometimes white, more often pale grey; in *malvæ* sometimes pure black, and more often grey of a deeper shade than in *malvoides*. Seen from above the bunch of black hairs in the middle in *malvoides* usually contains several white or grey hairs; in *malvæ* they are black or blackish. Less constant than the differences of the antennæ.

Joints of antennæ: Less on the average in *malvoides* than in *malvæ*, *on the whole*; but not constant, some examples even showing a different number on one antenna to the other!

Examination of ordinary and androconeal scales inconclusive.

Dr. Reverdin concludes with a number of observations from entomologists in the various countries where it occurs tending to show that *malvoides* invariably affects marshy ground, whereas this peculiarity has not been noticed in *malvæ*. I can supplement these with two further observations of my own to the same effect. My Biarritz *malvoides* were taken flying singly in the *marshland* outside that town; and my Bérisal example (as far as I recollect) in a damp upland pasture near to a mountain stream.

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* E. André, 'Lépid. de Saône-et-Loire' (Mâcon, 1902), under *alveus* var. *fritillum*, Hb., writes, quoting Frey, "Under side of the clubs of the antennæ rusty-red."

As a result of these discoveries, coupled with Dr. Reverdin's further discovery (based also on the character of the male appendages) that *Hesperia melotis*, Duponchel (= *hypoleucos*, Lederer), is a good species, it follows that some modification and amendment is required in Tutt's exhaustive account of *Hesperia malvæ* ('British Butterflies,' vol. i. pp. 221–255). His var. *pyrenaica* (p. 225), by reason of the date of captures made on the Pyrénées-Orientales, must be referred as a var. of *malvoides*—unless, as I suspect, it be *malvoides* itself. His var. *alpina*, for the same reason, is probably the mountain *malvoides* of Switzerland, and belongs, therefore, to that species.

Lastly, though I observe that Tutt cites and describes var. *melotis*, Dup., and var. *hypoleucos*, Lederer, as two separate varieties of *H. malvæ*—the former occurring at Locarno—Dr. Reverdin (and other authors) regard the names as synonyms of what now appear to be one and the same true species, *viz. melotis*.

Mr. J. Edwards, of Colesborne, having kindly determined for me the specific identity of *H. armoricanus*, Obthr., with *H. alveus*, despite certain pronounced superficial differences, my abstract of the classification of this particular group should now read as follows (*cf.* Entom. xliii. p. 308):—

To the vars. of H. ALVEUS add (*g*) var. *armoricanus*, Obthr.
For H. FRITILLUM, Rbr., read H. MALVOIDES, Elw. & Edw.
(*a*) ? var. *alpina*, Tutt.
(*b*) ? var. *pyrenaica*, Tutt.
and add H. MALVÆ, L.
(*a*) var. (et ab.*) *australis*, Tutt.
H. MELOTIS, Dup.

PUPATION OF LEPIDOPTEROUS LARVÆ IN GLASS TUBES.

By Rupert Stenton.

It may not be generally known that lepidopterous larvæ will pupate in glass tubes plugged with cotton-wool, and as far as I have observed, a larger proportion will do so more successfully in the artificial cocoon thus made than in the earth or other material provided for them in captivity. Of course, if biological data are desired it is the obvious thing to do, but does not seem to have been hitherto regarded as a simple alternative to the usual and more natural method.

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* I notice on p. 224, 'British Butterflies,' vol. i., Tutt gives full varietal rank to *australis*, n. var., but on p. 225 he calls a form from Digne *ab.* (et *var.*), and another from Draguignan, a few miles away, *ab.* simply.

I first noticed that larvæ would so pupate in the autumn of 1910, when an attempt at transferring external parasites to other hosts (Noctuid caterpillars) failed, partly perhaps through the intended victims too rapidly turning to chrysalids in the tubes. Since then, by way of a test, I have placed all my larvæ under the same conditions, and they have all, without exception, turned to healthy chrysalids; and in thus managing them I have found several advantages, among which may be mentioned the elimination of earth, &c., a decreased mortality when changing, being able to feed several species in the same cage without an eventual mixing of chrysalids, and keeping in touch with individual larvæ through to the imago; also, when travelling, to have the difficulties of dealing with larvæ then obtained, which desire to pupate, removed is an advantage, as they can be accommodated *en route* by carrying a supply of tubes and wool.

I must add, though, that I have had nothing like a sufficient number of caterpillars to make a really comprehensive test of the usefulness of this method. But perhaps some collector with greater opportunities, and to whom large boxes of earth and other impedimenta are cumbersome, may think it worth while to experiment.

St. Edward's, St. Mary Church, Torquay, Devon.

AN ATTEMPT TO COLONIZE *PAPILIO MACHAON* IN ESSEX.

By Professor Raphael Meldola, D.Sc., LL.D., F.R.S., &c.

In the November issue of the 'Entomologist' (vol. xliv. p. 365) there are three records of captures of this butterfly, one at Bishop's Stortford, one near Kelvedon, and a third at Enfield. The tendency to attribute the occurrence of the insect in districts so far removed from its native habitat to the exceptionally warm summer is quite justifiable, and may be the correct explanation. I remember in 1895, when at Sheringham, in Norfolk, seeing a boy sweep a specimen of *P. machaon* off a flower-head with his net, but this locality is not very remote from fenny districts. With respect to the recent captures in Hertfordshire, Essex, and Middlesex, however, I think it only right to offer a suggestion. In 1909, in the course of a conversation with the Earl of Warwick concerning a swampy area in the grounds of his estate at Easton, near Dunmow, in Essex, the wish was expressed that this marshy bit could be "naturalized" as far as possible, both with respect to insects and plants. With the concurrence of Lord and Lady Warwick I determined to try and introduce *P. machaon.* Large supplies of the food-plants were procured and planted round the swamp, and in the spring Lord Warwick and I attached six dozen chrysalids of the butterfly to various posts and walls of summer-houses round about. All the butterflies emerged in due course, and were seen from time to time sailing away, but no larvæ were found on the food-plants that season, nor have they been found at Easton since; neither has the butterfly been seen in the grounds. So far the experiment was a failure, and I believe that others who have attempted to introduce this butterfly into new districts have had similar experiences. But there is a lurking suspicion that these "escapes" from Easton may have founded a successful colony, or successful colonies, elsewhere, and that the recently captured specimens may have spread therefrom. Bishop's Stortford is only about eight miles in a bee line from Easton, and Kelvedon cannot be very much further. Enfield is the farthest point from the centre of distribution. It will be interesting to note what happens next season. Of course, it is too much to hope that any specimens seen at large should be simply recorded and not slaughtered. With strange butterflies, as with rare birds, the tendency is to "kill at sight." Had we been successful with the Easton experiment, it is needless to say that no "collecting" of this butterfly would have been permitted.

6, Brunswick Square, W.C.: Dec. 14th, 1911.

SOME BEES FROM FORMOSA.—II.

By T. D. A. Cockerell.

The genus *Nomia* is represented in the Sauter Collection by six species, but three others (*N. takauensis*, *N. mirabilis*, and *N. planiventris*) were earlier collected by Sauter and have recently been described, from males only, by Friese. According to the material before me, two species appear to be exceedingly abundant, and these are the species which also occur on the Asiatic mainland. The others, apparently endemic, are represented by few specimens.

Group A. (Subg. Hoplonomia, Ashmead).

Postscutellum with two large teeth.

Nomia punctulata, Dalla Torre, var. a.

Forty-six specimens, all males. The wings are dusky, and the first recurrent nervure joins the second submarginal cell beyond the middle; otherwise the insects seem not to differ from the mainland form. Finding no females, I wondered whether *N. maturans* could be the true female, although it is very unlike *punctulata* female as known from elsewhere. Close comparison led me to abandon this idea, for *maturans* differs from male *punctulata* in the duller surface of the mesothorax, the non-bilobed scutellum, and the dull metathorax, with the area merely granular. *N. punctulata* is a Chinese and Japanese species, while *N. maturans* is related to a species of the Philippine Islands.

The Formosan *N. punctulata* all come from Takao, August to October. The abdominal bands are light emerald green, the first two suffused with orange, the last two with purple.

Nomia maturans, n. sp.

♀. Length about 10–11½ mm.; black, the head and thorax strongly punctured, with rather abundant pubescence, white on cheeks, pleura and metathorax creamy-white on face and prothorax, black on mesothorax and scutellum, but white tomentum along hind border of mesothorax, and a little at the sides, postscutellum covered with white hair, slightly creamy above; head broad; eyes dark brown; mandibles strongly bidentate; clypeus and supraclypeal area with a delicate but distinct median carina, not reaching the lower margin of clypeus; sides of lower half of clypeus carinate; antennæ black, with the fourth joint red beneath, and the apical part of the flagellum reddish beneath; front shining, strongly and closely punctured; a flattened, slightly concave smooth area at side of each lateral ocellus; mesothorax dull, with very large strong punctures, sparse in the middle posteriorly; scutellum with strong widely separated punctures; postscutellum with two large triangular teeth; metathorax dull and granular, the area with a more coarsely granular band, the lateral areas strongly punctured; tegulæ black with creamy-white margins; wings dusky, stigma dark ferruginous, nervures brown; second s. m. rather broad, receiving first r. n. much beyond middle; legs black, with mainly white hair, ferruginous on inner side of tarsi; abdomen sparsely punctured, segments two to four with broad tegumentary orange bands, sometimes flushed with emerald green.

Hab. Takao, Formosa, three collected November 10th, 1907. Evidently closely allied to *N. quadrifasciata* (Ashm.) from the Philippine Islands; the first distinctly Philippine type I have noted among the Formosan bees. Some years ago I hastily examined Ashmead's type of *N. quadrifasciata*, but only noted that the abdominal bands were green tinged with orange-vermilion. Ashmead's description of *N. quadrifasciata* is rather incomplete, and his account of the legs of the female is evidently based on a male. In the colour of the abdominal bands, *N. maturans* also recalls *N. opulenta*, Smith. In Bingham's work on the 'Hymenoptera of India' it runs in the table to *N. elliotii*, Sm., from which it differs at once by the colour of the bands and the absence of a band on the first segment. According to Friese, *N. elliotii* also occurs in Formosa.

GROUP B. (subg. PARONOMIA, Friese).

Postscutellum unarmed; abdomen with coloured tegumentary bands.

Nomia thoracica, Smith.

The specimens have been compared with a *thoracica* from F. Smith's collection. Thirty specimens, including both sexes, all from Takao, July to October. Easily known from the other Formosan species of this group by the dense covering of moss-like fulvous or ferruginous hair on the thorax above.

Nomia megasoma, n. sp.

♀. Length about 13½–15 mm.; black, the head and thorax finely punctured, clothed with fulvous hair, that on the mesothorax not hiding the surface; mandibles thick, bidentate; clypeus shining, with scattered punctures, and with a median keel which is strong above, evanescent below; supraclypeal area convex, not keeled; antennæ black, the scape long, the flagellum obscurely ferruginous beneath; vertex angulate behind ocelli; front finely rugosopunctate; mesothorax dull, finely and rather closely punctured; scutellum irregularly punctured, the punctures of different sizes; metathorax shining, with scattered punctures, more or less in rows; basal area consisting of a broad shining transverse sulcus, crossed by raised lines, and a V-shaped median apical smooth area; tegulæ rather large, bright ferruginous; wings dusky, strongly orange-tinted, the apex with a dark fuscous patch; stigma and nervures ferruginous; first r. n. joining second s. m. near its base; legs black with ferruginous hair, the tarsi dark reddish; abdomen shining, sparsely punctured, the punctures on first abdominal segment distinctly larger than those on second; first two segments with fulvous hair, the others with mostly black, but fulvous at sides; hind margins of segments two to four with pale orange tegumentary bands, which are narrow, only covering about half of the apical depression; venter with much red hair.

Hab. Formosa (no special locality given); four specimens. In Bingham's table this runs nearest to *N. thoracica* and *N. formosa*, but does not closely resemble these species. *N. planiventris*, Friese, of which only the male is known, appears to be very similar, but the outer margin of the wing is dark,. not merely the apex. I am not sure that *N. megasoma* is not the female of *planiventris*, but, after carefully going over Friese's description, I have thought it best to regard it as distinct.

Nomia pavonura, n. sp.

♂. Length about 12 mm.; black, the head finely and irregularly punctured, the shining mesothorax and scutellum strongly and quite closely; head and thorax with very pale ochreous hair, white on lower part of pleura, light fulvous on sides of metathorax, on mesothorax and scutellum strongly mixed with dark fuscous; eyes strongly converging below; clypeus finely rugose, it and the supraclypeal area with a longitudinal carina; front densely punctured; hair on anterior part of cheeks shining silvery; antennæ long, black, basal half of flagellum with a poorly defined red band beneath; scutellum moderately bigibbous; metathorax shining, the basal area smooth, with a fine transverse raised line separating the apical part; tegulæ pointed behind, testaceous with a large piceous patch; wings faintly dusky, more strongly so on apical margin; nevures and stigma dusky ferruginous; first r. n. joining second s. m. beyond middle; legs black, with pale hair, reddish on inner sides of tarsi; hind femora moderately swollen, flattened beneath; hind tibiæ thick, trigonal, strongly curved, the broadly truncate apical lobe light yellow, stained at end with ferruginous; hind basitarsus pallid on outer side near base; abdomen more or less metallic, with purple tints, very strongly punctured, with broad tegumentary bands (occupying much more than half of the apical depression) on segments two to five; in the type the last two are iridescent, with brilliant emerald green and purple colours, while the other two (doubtless abnormally) are dull greenish; in a second specimen they are all dull greenish; penultimate segment with a dentiform lobe on each side; apex very broad, emarginate.

♀. Similar, but more robust, with the usual sexual differences; abdominal bands three, green without purple; hind femora beneath with a curled fulvous scopa, but scopa of hind tibiæ white; flagellum bright ferruginous beneath except at base; mesothorax and scutellum with most of the hair black or dark fuscous; scutellum with a median groove; basal sulcus of metathorax rather faintly beaded laterally; abdomen not so strongly punctured as in the male.

Hab. Takao, Formosa, August 18th, 1907, one female. The female approaches *N. iridescens*, Smith, but is much larger, with very much larger punctures on the two basal segments of abdomen. The closest affinity is with *N. chalybeata*, Smith, which differs in the colour of the thoracic pubescence. The insect may be regarded as the Formosan representative of *N. chalybeata*. The type is a male.

GROUP C.

Postscutellum unarmed; abdomen with hair-bands; tegulæ not enlarged.

Nomia mediorufa, n. sp.

♀. Length about 8 mm.; black, with the flagellum (dusky in middle above), the basal two-thirds or more of the first abdominal segment, the knees, the anterior tibiæ (with a large dusky cloud) and the tarsi ferruginous; pubescence of head, thorax, and legs fulvous, nowhere becoming white; head transversely suboval, eyes strongly converging below; face covered with appressed pale fulvous hair;

clypeus normal not keeled; mandibles red subapically; front, vertex, mesothorax, and scutellum granular from minute dense punctures; basal sulcus of metathorax with fine transverse ridges; posterior face of metathorax dull and rough, with much hair; tubercles, upper border of prothorax and postscutellum densely covered with hair, but surface of mesothorax not hidden by hair; tegulæ clear ferruginous; wings dusky, nervures and stigma pale ferruginous; b. n. not quite reaching t. m.; abdomen very finely punctured; hind margins of segments testaceous, with heavy broad fulvous hair-bands, widely interrupted on first segment, thin in the middle on second; apical ventral segment broadly rounded.

Hab. Koroton, Formosa, September 8th, 1907, two females. *N. takauensis*, Friese, was based on males from Takao and Ku-sia, Formosa; it appears to resemble *N. mediorufa*, having the same fulvous pubescence, but the abdomen is not red at base, and the mesothorax and scutellum are much more densely hairy. I do not think *takauensis* can be the male of *mediofura*. In Bingham's table *N. mediorufa* runs near *N. floralis*, Smith, but the clypeus is produced at apex into a short truncate lobe, not toothed as in *floralis*; the hair of face is pale fulvous, not fuscous as in *floralis*; and the scutellum is closely punctured, while in *floralis* it has scattered punctures. *N. maculitarsis*, Cam., may also be compared, but that species has smooth silvery white apical margins to the abdominal segments.

Nomia mediorufa gyammensis, n. subsp.

♀. Like *N. mediorufa*, but abdomen not at all red basally; legs darker, hind tibiæ with dark, fuscous hair on outer side; pubescence paler, the abdominal bands very pale ochreous; flagellum black above except at apex.

Hab. Gyamma, Formosa, April 6th, 1907. This is almost exactly like the Australian *N. halictella*, Ckll., so much so that without very close scrutiny they would be considered identical. *N. halictella* has the wings distinctly darker, and is a larger insect, but the resemblance is most extraordinary, extending to every microscopical detail. It is a question whether *N. gyammensis* and *mediorufa* should not be regarded as races of *halictella*, in spite of the wide geographical separation. Among the Indian species *N. gyammensis* may especially be compared with *N. kangræ*, Nurse, in which, however, the pubescence hides the sculpture on front, and there are other differences. It is easily known from *N. opposita*, Sm., by the smaller size and light nervures, and from *N. fruhstorferi*, Per., by the yellowish hair-bands on abdomen, &c. In Bingham's tables it runs nearest to *N. aurifrons*, Sm., which is very different.

A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

By H. Rowland-Brown, M.A., F.E.S.

(Concluded from vol. xliv. p. 389.)

(iv) *Dompierre-sur-Mer, Charente-Inférieure.*

I think the qualification of my title admitted in a previous paper of this series is not required for Dompierre-sur-Mer, which is six miles away from the sea north-east of La Rochelle, in the Charente-Inférieure, and only designated "sur-Mer" to distinguish it from several other Dompierres elsewhere. But Dompierre has a history, and a very remarkable one, which I may briefly state, inasmuch as one incident at least bears directly on the entomological wealth of the region. From La Rochelle to Dompierre, and for some little way further inland, there is a canal, and along the huge bank of excavated earth on the south side runs the railroad to Nantes. At this particular spot the banks are scarcely less than fifty feet deep, and almost perpendicular, so that there it is not possible to scramble up or down, and close to the station is a long tunnel, through which the canalized waters of one of the Sevre rivers (the neighbouring Department is that of Deux-Sevres) are carried. The work was conceived by Louis XIV., and achieved, so far as it goes, by convict labour. But it has never been completed, and the waterway is abandoned. The soil, however, is calcareous, and for two hundred years the immediate surrounding land on each side has been left uncultivated—a wild garden such as one seldom encounters elsewhere in a country where great enclosed estates are unknown, and every inch of available earth pressed into the service of industry. When I entered this No-man's Land, on the morning of August 4th, I must confess that the prospect filled me with dismay. Every blade of grass seemed to have been burnt up by the fierce sunshine of the past weeks, and such land as might have escaped on the railway banks had been devastated by fires. However, I set out for the village of Dompierre, about three-quarters of a mile away, to seek out M. Vigé, the schoolmaster, who is an enthusiastic lepidopterist, and would no doubt guide me to the best localities. Not only did he offer me the warmest of welcomes and the requisite advice, but, net in hand, accompanied me back to the canal-banks, where, despite the drought, a few green oases survived. Now, my chief object in visiting Dompierre was to investigate the wonderful Lycænid races, duly recorded and examples of many figured by M. Charles Oberthür ('Lépid. Comparée,' fasc. iii., Rennes, 1909). In particular there is the blue form of the female of *Agriades thetis* (= *bellargus*), ab. *cœlestis*, Obthr., in which the upper side of the wings is suffused entirely with a silky blue, closely approximating to the colour of typical males. I may say at once that I did not have the good fortune to net a single one. The males of the second generation were just coming out, the one sole female, observed *in cop.*, being of the normal and, at Dompierre apparently, the rarer form. Thus, just as at Angoulême, in Charente, I had been too early for the *cœlestis* of the first brood, here I was in advance of the next emergence. Still, there were many compensations in store for me, for *A. thetis* is not the only member of the family which exhibits this remarkable tendency to "cæruleanism" in the female. *A. corydon* was well out, the males in hundreds flitting over the dry grass-bents, with rarer females, all of which, or nearly all, were ab. *tithonus*, Mieg. (= ab. *syngrapha*, Kef.), and I was able to collect on this day and the morning of the 5th a very respectable series of this exquisite butterfly. In size they show great variation, from about the dimensions of a large *Cupido minimus* to those of the fine well-developed British type; while I took one with the nervures superimposed blue, and striated as in the remarkable form first described from a less pronounced example by Gaschet as ab. *radiosa* (*cf.* 'British Butterflies,' Tutt, iv. p. 31).* I gather further from M. Oberthür's illuminating account of the species that the blue female form predominates here over the brown, and though there were many fine richly coloured brown females in evidence, the *tithonus* form was decidedly the commoner of the two. In the case of *Polyommatus icarus*, also abundant on the wing in both sexes, I could observe no marked predominance of the blue form; indeed, it was decidedly less in evidence than I have found it on the Chilterns and other English localities where "blues" are common. I took, indeed, but one worn female corresponding in detail to the ab. *supracærulea*, Obthr. (*op. cit.* p. 147). None the less, it is worthy of observation that in this *natural* locality the blue females of the *Agriades* group should apparently tend to oust the "brown," while another still more remarkable feature is the extraordinary frequency hereabouts of androgynous *P. icarus*. M. Réne Oberthür informs me (*in litt.*) that his collector in the spring of 1911 brought back no fewer than twenty-seven such examples—surely a record! Single *Everes argiades*; *Lampides bœticus*, common round the acacia-bushes; two or three belated *Lycæna arion*, which I was unable to net; *A. medon*, of the second emergence; and, less frequently, *Nomiades semiargus* complete the tale of "blues" upon the wing. But M. Vigé tells me that Dompierre produces *L. alcon*, and *P. escheri* var.

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* M. l'Abbé Gaschet's *radiosa* is described from examples taken also in the Charente-Inférieure—St. Georges, near Royan, which is in the extreme south-west of the Department, as Dompierre is in the extreme north-west. It is probable, therefore, that the aberration is not unusual in this region.

helenæ, Obthr., has, of course, been distinguished and named quite recently by M. Charles Oberthür from examples taken in this same district.

But, notwithstanding the arid condition of the soil and the exhausted verdure both of plants and trees, there were countless butterflies besides Lycænidæ upon the wing. The fast-fading clumps of valerian on the railway bank were clustered with *Colias edusa* and *C. hyale*, and occasional *Pontia daplidice*; while on the outskirts of a little pine-wood, which filled the whole air with sweet resinous odour and afforded a grateful shade, fresh examples of *Papilio machaon* were chasing each other with an energy we poor perspiring mortals might well envy. *Pyrgus sao*, isolated *Carcharodus alceæ*, and *Nisoniades tages* represented the "skippers," while every blue thistle was alive with *Epinephele tithonus*, and the driest pathways and glaring masonry of the canal with *Hipparchia arethusa*; that other heat-loving Satyrid, *H. briseis*, being not yet emerged. Of the Argynnids I saw nothing; they must have been well over in this forward season, but a fresh brood of *Melitæa cinxia* was about, and some very small but lively coloured *M. phœbe*. Several stout Anthrocerid larvæ also found their way into the net, although the only member of the family on the wing was *A. fausta*, very small and in brilliant condition.

But the sands of holiday-time were already running low, and I could only give Dompierre a second visit of a few hours on August 5th, though in a normal year, throughout the collecting season, a profitable month might be spent in the Charente-Inférieure. The difficulty is to work this locality from comfortable headquarters. The best way, I should think, to reach La Rochelle is by steamer to La Pallice from Liverpool, thus avoiding the tiresome journey across France; or, if the long sea-voyage is not convenient, *via* Southampton, St. Malo, Rennes, and Nantes. The trains stopping at Dompierre from La Rochelle are, however, very limited in number, and there seems no alternative between spending the whole day there from ten to six, or returning a few hours before noon. But there is a small café opposite the station, kept by a sympathetic landlord, who waxed eloquent on the entomological treasures of his locality; and it is, therefore, not necessary to transport *déjeuner*, a consideration when box-room is limited, and the sun making every ounce, human or otherwise, tell against the carrier of bag or satchel. I cannot recommend the small hotel in which I put up at La Rochelle, but I dined each evening at the Hôtel du Commerce in the Place d'Armes, and it appeared to be admirably managed.

Butterflies observed at Dompierre-sur-Mer, Charente-Inférieure, August 4th and 5th, 1911.—*Carcharodus alceæ; Pyrgus sao; Nisoniades tages; Lycæna arion; Nomiades semi-*

argus; Agriades corydon, and ab. *tithonus*, and ab. *radiosa, A. thetis; Polyommatus icarus; Aricia medon; Everes argiades; Celastrina argiolus; Lampides bœticus; Papilio machaon; Pontia daplidice; Colias hyale, C. edusa; Gonepteryx rhamni; Melitæa phœbe, M. cinxia, M. didyma; Pyrameis cardui, P. atalanta; Aglais urticæ; Polygonia c-album, Pararge megæra; Hipparchia semele, H. arethusa; Epinephele jurtina, E. tithonus.*

Harrow Weald: December, 1911.

THE IMMIGRATION OF *PYRAMEIS ATALANTA.*

By Major B. Tulloch, F.E.S.

I have been much interested in reading in various numbers of the 'Entomologist' discussions as to whether *P. atalanta* is a regular immigrant to the British Islands or not.

Without wishing to lay down the law in any way, and say definitely that *P. atalanta* does or does not immigrate regularly, yet I should like to make a few observations bearing on the subject, and relate certain facts that have come under my own observation. There are always two sides to every question, and my remarks may tend to prove that I am an "anti-immigrationist." As a matter of fact, I have an open mind on the subject, but I am afraid I cannot enter into any wordy warfare with such eminent authorities as Mr. Frohawk, for instance, as I am too far away. Therefore, from the safe distance of Hong-Kong I can only state facts as known to myself, and leave others to draw their own conclusions.

My life at school, and afterwards as a soldier, has led to my having lived at certain places which were peculiarly well placed for the observation of the movements of butterflies across the sea. I can also lay claim to have been an observer of butterflies and moths ever since I can recollect catching beetles in the sand on the neutral ground of Gibraltar about 1874. Since then I have lived, amongst other places, at Dover (one period of three years, and another of two years), at Guernsey one and a half years, Alderney one year, Malta one year, Mauritius two and a half years, and now I am on another island—Hong-Kong.

Now, of the above places, Dover, Malta, and the Channel Islands are situated on the known lines of flight of migrating birds.

Before continuing the subject further I should like to ask the upholders of the theory of the immigration of butterflies, and of *P. atalanta* in particular, whether they will agree to the fact that butterflies do not fly by night, or on cloudy days (in England, but not necessarily in the tropics), or when there is a strong east wind blowing or a stiff south-wester, nor as a rule before 10 a.m., nor after 4 p.m., except to sun themselves? I should also like to know whether they consider that *P. atalanta* immigrates in swarms or singly, whether they are supposed to come from the east from Germany, Holland, and Belgium, or from the south from France? If they come from the east, they can only come on an east wind, which they hate, and the distance across the North Sea is too far for them to travel in a day—and by night they do not fly. If they are supposed to come from France in the spring, then any reference to meteorological records will show that in late spring or early summer there are a very great number of days when a strong cold east wind blows; in fact, I have recollections of east winds prevailing all through May. If the butterflies immigrate in swarms, then surely some entomologist in North France must have noted the gatherings preparatory to migration, in the same way that swallows gather preparatory to their autumn flight abroad. If it is contended that *P. atalanta* comes over by single individuals in the spring, then what theory is advanced that it should only enter the head of certain individual butterflies to migrate, and must not the number of individuals be very great to admit of their spreading over England?

I have previously stated that Dover, Malta, and the Channel Islands are places on a regular line of migration for birds. Any day during spring or autumn, about the time that certain birds migrate, you will find those birds at Dover, Malta, and the Channel Islands in places where you do not see them at any other times. For instance, standing on the shore at Dover, one can observe the swallows coming to land, and in my garden on the outskirts of the town during the migrating season I have seen numbers of warblers and small birds that live outside towns. Now apply the preceding remarks to the migration of *P. atalanta.* It can only arrive by day, during a limited number of hours, from France, on a south-east to south-west breeze, not too strong, at certain times of the year, and the sun must be shining, and there must not be any abnormally large gathering of the butterflies reported on the north coast of France. Given the above conditions, has anybody noticed *P. atalanta* arriving over the sea in sufficient quantities to spread all over England and be the parents of the autumn specimens? Personally I have never noticed them, and for the five summers that I lived at Dover I suppose I was on the cliffs or in a boat pretty well every fine day that was possible, and I take it that Dover is the most advantageous place possible in which to note the arrival of "red admirals." I have noticed every year in my garden in spring abnormal numbers of small birds immigrating and going inland, but never abnormal numbers of *P. atalanta,* and yet the autumn brood appears regularly. I always "sugar" for *P. ata-*

lanta in the early autumn because I like watching them (not to "collect" them), and the autumn supply always seems to me to be pretty constant, however few I may have seen in the spring. Neither have I observed any numbers passing the Channel Islands.

At Alderney, in 1892, there was a perfect plague of *Colias edusa* and *Macroglossa stellatarum*, but they remained in Alderney the usual period, and did not leave the island. Will somebody turn up the back files of the 'Entomologist' to see whether 1892 was a clouded yellow year in England or not?

In Malta, *P. atalanta* is a very common insect. It appears to have a succession of broods there. I had particularly good opportunities of observing the insect in that island, as my road to work every day led me past a spot where the insect bred freely. I could always find it in one or other of its stages, and when the perfect insects emerged I never noticed that they moved far from the particular locality, neither did the numbers of butterflies appear to diminish as though they migrated, although Sicily and Italy are handy places for them to go to.

Being very keen on sea-fishing and rowing, I spend many days on the water, and at none of the islands where I have lived have I seen any migration of butterflies, not even at Dover.

Individual butterflies of course I have seen, but those I always put down to chance ones, blown off shore, or those that have lost their way. One day, when steaming near Aden, a sudden squall came off shore and brought with it hundreds of locusts and many butterflies, which afforded amusement to the children on deck, who enjoyed a butterfly and locust hunt at sea, but nobody could say that either insect was migrating. One often reads in accounts of tropical butterflies about the migrating swarms of certain kinds, and especially species of *Catopsilia* and *Callidryas*. Has anybody ever followed up a swarm, or had a correspondent at the other end of the line of flight to say where the butterflies ceased their wild career? I take it the answer is "No," because it is generally impossible in the tropics to go straight across country, on account of the jungle. In Mauritius, however, I once did see a migrating swarm—or rather thought I did. It happened that one bright day when the south-east trade wind had died away and a "Malagash" wind, *i. e.* a westerly breeze from Madagascar, was blowing, that I went butterfly hunting on the Trou-aux-Cerfs. Now a "Malagash" wind only blows but very rarely, and when it does, the atmosphere is very clear and bright but hot. The Trou-aux-Cerfs is an extinct volcano, with a well-formed crater, perfectly circular, filled with jungle, and on the outer sides grow small trees, bushes, and lots of grass and *Lantana*. On arriving near the top of the crater, and whilst collecting on the outside slope, I noticed that there was an abnormal number of *Atella phalantha* about, a common insect at any time in Mauritius. Soon I noticed that they were in immense numbers and all flying in one direction, *viz.* up towards the top of the crater and down wind, *i. e.* towards the east. Here at last I thought is a migration of butterflies, such as I have often read about. Then the thought occurred to me, "Where do they go to when they get to the top of the crater—do they go right up into the air and drift away to sea, and what happens to them there?" This seemed a problem that I could solve if I climbed to the top and looked to see whether they went away in any given direction, probably going straight before the wind. Up I went to the top, when I found that the insects did not go any higher, but just made a bee line for the other side of the crater, one after the other—thousands of them. Then I walked round to the other side, when I found to my astonishment that they were now all going downhill. This required some further explanation, so downhill I went after them till I got nearly to the bottom of the Trou, when I found that the swarm was now going right-handed round the base of the volcano. After them I went round to the other side again, where I had been before, when I found that the swarm went uphill! In fact, the butterflies were all going on an endless round, up the hill, across the top, down again, and round to where they started. So much for a migration when followed up. Why the butterflies did it I don't know; perhaps because as it happened to be a particularly fine day they were feeling extra fit and happy, and were indulging in a butterfly game. Possibly somebody will explain, for I cannot.

Hong-Kong, South China: August 11th, 1911.

A SECOND LIST OF THE APHIDIDÆ FOUND IN KENT.

By Fred V. Theobald, M.A., F.E.S., &c.

(Concluded from vol. xliv. p. 399.)

Genus Hyalopterus, Koch.

Hyalopterus flavus, Kittel.—On cultivated aquilegias in a garden in Wye, found by Mr. Alban Duffield, June 6th, 1911; a few winged and wingless females.

H. dilineatus, Buckton.—On the upper surface of young rose leaves, Wye, May 21st, 1911. All wingless females in small colonies along the middle of the leaves.

Genus Chaitophorus, Koch.

Chaitophorus versicolor, Koch.—On maple leaves, Wye, May 5th to June 25th; winged and wingless females. Also at Hollington Wood, near Hastings, May 12th, 1911. This is given by Schouteden as a variety of Linnæus's *populi*, which I have been unable to find in Kent.

C. salicivorus, Walker.—Wye, on the under side of willow leaves. Very pale and sluggish, all wingless females, July 10th, 1911.

C. capreæ, Koch.—Wye, on willows, July 10th, 1911, under the leaves. Winged and wingless females.

Genus CALLIPTERUS, Koch.

Callipterus quercus, Kaltenbach.—Wye; abundant on oak leaves in June, and on to September 22nd. Winged females and young under and on the leaves, and producing much honey-dew, especially abundant high up on the trees. The species and the *querceus* of Kaltenbach are placed in Mordwilko's genus *Tuberculatus*.

C. castanææ, Buckton. — Godmersham; beneath leaves of the sweet chestnut, June 9th and 29th, 1911. Winged and wingless females. Placed in the genus *Myzocallis*, Passerini, by Schouteden.

C. alni, Fabricius.—Wye; common on alders by the old river. Winged females and larvæ, &c., under the leaves and causing little or no harm, very numerous from June to August. None seen in September. Many winged females also occured on willows, osiers, hazel, and on water grasses growing under and around the alders. Schouteden now places this in *Pterocallis* of Passerini.

C. carpini, Koch.—Wye, July 14th, 1911, a few apterous females on birch leaves, very uncommon in the neighbourhood. Schouteden makes this the same as Goetze's *coryli*. From a casual examination so far it seems distinct.

C. querceus, Kaltenbach.—Under oak leaves, Wye, July to September. The adult winged females skip readily, whilst the apterous females crawl backwards and stick tenaciously to the leaves. Not abundant. Also from Pitlochry, N.B., September 7th, 1911.

C. betulicolæ, Kaltenbach.*—A single wingless female and a nymph on under side of birch leaf, Wye Downs, July 30th, 1911, the latter hatched on August 7th. This species was also sent me from Pitlochry, N.B., in September by Mr. A. Duffield. Most on birch, but a few winged females on oak.

C. betularius, Kaltenbach. — A few apterous females and many larvæ under birch leaves, Wye, August 13th, 1911, on the downs.

These last two should also come in *Myzocallis*.

Genus DREPANIDOSIPHUM, Koch.

Drepanidosiphum platanoides, Schrank.—Wye Downs, July 30th, 1911. Many winged viviparous females on maples and sycamores, beneath the leaves, a few only on each leaf, all of the green variety.

Genus APHIOIDES, Passerini (CLADOBIUS), Koch.†

Aphioides (*Cladobius*) *populeus*, Kaltenbach.—A single colony of some seventy wingless females from a poplar, Wye, July 14th, 1911. The insects were densely packed on the young wood near the top of a shoot. After several days' searching, I could find no more of this marked species.

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* Kirkaldy (1905) places this in his genus *Kallistaphis*; it certainly differs from typical *Callipterus*, in which genus Buckton places it.

† Kirkaldy (1905) proposed the new name *Aristaphis* for this genus. Schouteden places it in Buckton's genus *Pterocomma*.

Genus PEMPHIGUS, Hartig. (BYRSOCRYPTA, Haliday).

Pemphigus pyriformis, Lichtenstein.—Ulcombe and Bilting, near Wye, June. Galls full of winged females, continued at Bilting until July 9th, when winged females, pupæ and larvæ, still in galls. Also from Haddenham, Cambridgeshire, June 27th, 1911.

P. marsupialis, Couchet.—Bilting, near Wye, July 9th, 1911. Galls found on poplars with the former, but scarce. Winged females and nymphs and a few larvæ.

P. affinis, Kaltenbach.—Bilting, near Wye, July 9th, 1911. Very abundant on poplars with above, notably with the latter on the pointed-leaved poplars. All winged females, many having left the galled leaves. Colour of young galled leaves tinged with red and pink, of older ones pale yellow. The females with very mealy coverings.

P. filaginis, Boyer.—Wye, near railway station, on *Gnaphalium uliginosum*, the marsh cudweed; September 17th, on a few roadside plants. Many apterous females and one winged. Looks much like *P. affinis*,* but slightly distinct. Produces a copious mass of white wool. I failed to find the host plant near Bilting, where *P. affinis* occurs on the poplars some two miles away. At this time there is no trace at all of live *Pemphigus* on the poplars, and it is quite possible that Boyer's *filaginis* is the migrant form of the poplar gall aphis of Lichtenstein.

Kaltenbach's *Gnaphalium* appears to be the same species.

P. lactucarius, Passerini.—On lettuce, July 24th, 1904, Wye. Wingless females and also winged females.

Genus SCHIZONEURA, Hartig.

Schizoneura corni, Fabricius.—On *Cornus sanguinea* near Wye; winged females appeared in abundance beneath the leaves on October 7th, and produced living young. Still breeding, October 17th, and very numerous.

Genus LACHNUS, Burmeister.

Lachnus tomentosus, De Geer.—Wye Downs, on Scots fir, August 20th, 1911, a colony of wingless females. Also sent me on September 10th, from Pitlochry, N.B., by Mr. Duffield. I have three other *Lachnus* which I cannot yet identify, all from Conifers.

Genus VACUNA, Heyden.

Vacuna dryophila, Westwood.—Wye, on oaks, July 4th, 1909. Winged and wingless females.

Genus RHIZOICUS, Passerini (RHIZOBIUS Burmeister).

Rhizoicus (*Rhizobius*) *graminis*, Buckton.—Roots of grasses, Paddock Wood, 1904, in winter.

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* Lichtenstein (1886) places this as the type of his genus *Bucktonia*.

LEPIDOPTERA OF THE SWEDISH PROVINCES OF JEMTLAND AND LAPLAND.

By W. G. Sheldon, F.E.S.

(Continued from vol. xliv. p. 362.)

Abisko is finely situated on the southern shores of the beautiful Torne Träske, at an elevation, according to Baedeker, of 1296 ft. The lake has a length of about sixty and a breadth of eight or nine kilometres, and is surrounded on all sides by mountains, which rise steeply out of it for a height of from 2000 to 5000 feet. The shores are covered for some 500 feet above its level with forest, composed chiefly of birch, with, however, a sprinkling of mountain ash and here and there an isolated pine, and there are large quantities of sallow of many species in the swampy ground. This forest consists of trees, which on the water's edge attain a height of twenty feet, and in sheltered positions, especially on the north side of the lake, thirty and even forty feet is reached. The undergrowth consists chiefly of *Vaccinium* of various species; here and there along the whole length are tracts bare of trees, and more or less swampy; and it is in these spots and on similar ones inland from the lake that the butterflies of the district are almost exclusively found. They have a growth of *Vaccinium* of four species, crowberry, dwarf sallow, dwarf birch, and many beautiful flowers, including *Andromeda polifolia*, *A. tetragona*, and the nearly allied *Phyllodoce cœrulea*, *Dryas octopetala*, *Trientalis europœa*, *Silene acaulis*, *Astragalus alpinus*, saxifrages of several species, *Rhododendron lapponica*, *Azalea procumbens*, and many others; in fact, the flora is for so high a latitude a very rich one, and reminds one very strongly of that of the higher Alps, many species being common to both.

Naturally the "national park" greatly hampers one's proceedings—much of the most fruitful ground, and the whole of the most convenient, is included in it—and for this reason, although the district all round is a magnificent one, and would probably, if thoroughly hunted, produce nearly all of the species of Rhopalocera known to inhabit the Arctic regions of Scandinavia, I am compelled to advise entomologists and naturalists generally to give it a wide berth, at any rate for the present. In the course of time, as the country gets more developed, and there is a proper service of boats on the lake that would enable all parts of it to be worked, and huts are built in the mountains round, the case would be different. I should mention that the surroundings of the hotels of the Swedish Touring Club in other parts of the country have also been constituted national parks, and therefore the objections to Abisko as a resort for naturalists apply to them also. In time no doubt the drastic nature of the regulations will be mitigated, for, judging from those I conversed with on the subject, they are exceedingly unpopular with the great majority of the Swedes themselves.

I had a very bad experience with the weather at Abisko during my stay from June 16th to July 18th. There was not much rain—the rainfall of Lapland is quite small, the average being only sixteen inches per annum—but the weather was cold and sunless throughout. During the whole of the time there were only two cloudless days—June 18th and July 12th; out of thirty-two days, eleven were absolutely sunless, and on many of the others the sun was very fugitive, and one could do but little. Up to the end of June the weather was passable, but after that date it got much worse, and during the last six days of my stay the sun did not appear at all. The temperature also was very low. There was a thermometer outside the hotel, from which, between July 6th and July 18th, I took the temperature daily at 8 am. and 2 p.m. The highest reading was 57°·2 Fahreneit at 2 p.m. on July 12th, and one day at that hour it did not exceed 42°·8. The average at 8 a.m. was 48°·7, and at 2 p.m. 50°·5. The slight difference between the early morning and afternoon temperatures was accounted for by the sun being above the horizon during the whole twenty-four hours of the day. With these temperatures one wonders that butterflies would fly at all, but it did not seem to much matter how cold it was so long as the sun was shining: such as were out flew merrily. At the date on which I reached Abisko the season was apparently an early one, and species were well up to the expected dates; but of course the cold period put a stop to emergence or greatly delayed it, and specimens got fewer every day. One species found by Mr. Rowland-Brown I did not see, and others were evidently just emerging at the time of my departure. I had intended staying until the end of July, but the weather outlook was so hopeless at the middle of the month that I decided to get away, and the reports from other districts in the north being equally bad, it did not seem to be of use trying elsewhere.

Undoubtedly, 1911 in Arctic Europe was a very dull and cold summer; in southern Scandinavia as far north as Stockholm the weather was very hot and dry, but north of this line the reverse took place. I am informed that it is often the case that when in Britain we get a good summer, in Lapland it is cold and wet; and when it is cold with us it is usually a fine season in the north. 1910, for instance, which it will be remembered was one of the most inclement summers we have experienced for many years in Britain and Central Europe, in Lapland was singularly fine.

Of course the conditions I met with greatly governed the number of species and specimens found; in Jemtland I came across twelve species of Rhopalocera, and at Abisko sixteen species, and an additional one at Narvik on my return home, which journey took me ten days, *via* the west coast, the beautiful Bergen and Christiania Railway, and the steamer from the latter place to Hull.

Of the species found by Mr. Rowland-Brown at Abisko I met with all except *Chrysophanus hippothoë* var. *steiberi*. I am informed from German sources that *Melitæa iduna* has been taken along the shores of the Torne Träske on the way to Björkleiden. I searched carefully and often for this species, but did not find it; and that *Brenthis polaris* and *B. frigga* are found on Nuolja, the mountain immediately at the back of the hotel. I saw in the National Collection at Stockholm an example of *B. frigga* var. *improba*, which was taken at Björkleiden, near the waterfall. I learn from Herr Max Bartel that *Colias hecla* var. *sulitelma* is found not infrequently on the north side of the lake above the tree line, in July. The best localities for collecting which I could find outside the park were: (1) the road leading through the forest from Abiskojokk to Björkleiden, and in the mountains round the latter place; (2) by taking the path alongside the Abiskojokk (right bank) for a mile or so until a marble quarry is reached, one comes to a series of swamps stretching eastward; some of these are certainly in the Park, some are just as certainly not, and some are doubtfully so; (3) probably the best ground of all is reached by walking along the railway, eastwards, past Abisko Station, and then following up the first brook one comes to, about a kilometre past the station. Along its course are some fine swamps, containing *Brenthis pales* var. *lapponica*, *B. aphirape* var. *ossianus*, and *B. freija*; higher up, towards the valley called the Lapp Porten, *Hesperia centaureæ* was commoner than I found it elsewhere in Lapland; on the sides of the Lapp Porten itself, *Œneis norna* and *O. bore* were not infrequent.

The birches, at the date of my arrival at Abisko, were quite brown; some trees had the leaves half developed, but in many instances the buds had not burst from the winter sheath. It was exceedingly interesting to watch them develop under the influence of the perpetual light, within one week all the trees were quite covered with full grown leaves. On dull days I spent my time chiefly in observing the birds of the district, which were very interesting to a Britisher. I suppose there must have been several hundreds of pairs of fieldfares breeding on the shores of the lake between Abiskojokk and Björkleiden, and of other British winter birds, redwings, bramblings, and mealy redpolls were very abundant on the same ground; quite half a dozen pairs of rough-legged buzzards had their eyries within a mile of the hotel. Of the Scandinavian mosquito one could say a good deal: they were everywhere, both in Jemtland and Lapland, and certainly most abundant in the former province;

probably the cold weather experienced at Abisko prevented many of them from emerging, or delayed their emergence until after my departure. For protection at night I had a small bell-shaped mosquito curtain, which was suspended by a brass hook to the wooden ceiling of my bedroom. I found this an efficient safeguard; without it I do not see how it would have been possible to sleep, at any rate with the window open. During the day it was absolutely necessary in warm weather to wear a veil and gloves. In spite of these precautions I got a good deal bitten; fortunately the mosquito in these regions does not have much foul matter to feed upon, and so far as I was concerned the inconvenience was only temporary. I saw, however, a number of people who were not so fortunate, and whose faces and hands were greatly swollen from the effects of their bites.

The species I met with are as follows:—

Pieris brassicæ.—Flying about the gardens at Mattmar; of average size, with very pale tips to the front wings.

P. napi var. *bryoniæ.*—Common at Abisko, and well out in both sexes at the time of my arrival there. The species was somewhat local, its occurrence being dependent apparently on the abundance of its usual food-plant in Lapland, *Arabis alpina*, which, except for a small *Draba* and a species of *Cardamines*, was the only Crucifer I saw. The butterfly was most abundant by the side of the road leading to Björkleiden. The females, all of which are var. *bryoniæ*, are very variable; some have the spaces between the veins showing pronouncedly white, others are suffused over almost all the wing area with the grey shading, and a certain portion of both of these forms are ab. *sulphurea.* I had no difficulty in procuring as many ova as I required, most of which I sent to the late Mr. A. Harrison, who specialized in this species. Others I brought home have since pupated.

Colias nastes var. *werdandi.*—Abundant everywhere on swampy ground at Abisko, frequenting the drier parts of the swamps, and also certain banks where its food-plant, *Astragalus alpinus*, grows, and extending up the mountains to at least 1000 ft. above the lake. The species was well out in both sexes at the date of my arrival, June 17th, and certain examples were then wasted. There is no doubt but that in an average year it is out in the first few days of June, and probably at the end of May. By the end of June the majority were worn, and the species quite disappeared about July 7th. The male flies swiftly, with the usual *Colias* flight, searching for the female; it frequently rests on the ground, but rarely on flowers, the only flower favoured, so far as I saw, was *Silene acaulis.* The flight is so swift, and the ground frequented rough and in places swampy, it is better to lie in wait, and the butterfly can then be captured freely. The female flies much more slowly.

Of this species I brought home a very variable series of twenty-eight males and twenty-seven females. As I understand the named European aberrations, they are as follows:—

(i) A female form with ground colour of the wings pale sulphur, as in the male = ab. *sulphurea*, Lampa.

(ii) A form of both sexes with ochre-yellow wings = ab. *christiernssoni*, Lampa.

(iii) A male form with the black band of fore wings not pierced with lighter nervures, and without the dark submarginal band = ab. *immaculata*, Lampa.

My series contains three examples of ab. *sulphurea* and four examples of ab. *immaculata*, but it is entirely without ab. *christiernssoni*, of which there is a long series in the National Collection, labelled as from Lampa, and apparently taken at Kvickjock.

In addition to these forms, my series contains the following:—

(i) Males with the ground colour of both fore and hind wings of the same light yellow as that of the blotches in the border of the wings of typical examples of *C. phicomone* from the Alps = ab. *torneoensis*, n. ab. I have three specimens of this form.

(ii) Males of very pale yellow, almost white, of the tint of the typical female = ab. *pallida*, n. ab. I have two of this form.

(iii) Females with the light blotches in the dark margin of the front wings forming a continuous light band, except that the dark wing-nervures pass through it = *connexa*, n. ab. Of this form I have half a dozen examples.

(iv) Females with the light sulphur discoidal spot on the upper side of hind wings orange coloured=ab. *flavopunctata*, n. ab. I have one example of this form.

(v) Males and females with the discoidal spot on the under side of the hind wings wholly chestnut-brown and without the white centre that is found in the type = ab. *castanea-punctata*, n. ab. I have four of this aberration.

I succeeded in obtaining ova, both from captured females and by search, and despite the difficulties caused by the long journey home two of the larvæ have reached the last stage. The wing expanse of my largest males and females are respectively 50 mm. and 56 mm.

C. palæno var. *lapponica*.—Herr Spröngerts writes me that he saw two specimens near Abisko station on July 22nd.*

(To be continued.)

BY THE WAY.

"On the 12th of December, at Holy Trinity Church, Upper Chelsea, by the Rev. E. M. Vaughan, vicar of Old Basford, assisted by the Rev. H. R. Gamble, vicar of the parish, and the Rev. E. G. Alderson, vicar of Stopsley, Sir John Robinson, of Worksop Manor, Notts, to Eveline Maude, elder daughter of Mrs. Alderson, Park House, Worksop."—'Morning Post.' We hasten to congratulate Lady Robinson, who is so well known amongst us as a thoroughly good and practical all-round British entomologist. We trust she will still be enabled to spare some of her leisure for the study of insects.

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* It certainly should occur here, though I never saw an example in the much more favourable and advanced season of 1906. Its food-plant, *Vaccinium*, grows everywhere.—(H. R.-B.)

How far are the common or kitchen cockroaches become naturalised in Britain now? A lady writes in reference to a remark at p. 298, that she well knows at least three truly rural houses overrun by the beasts. The first, in Gloucestershire, stands some two hundred yards from any other, surrounded by fields, except the front which looks over drive and garden to a large wood with small field between; village beyond road and drive—quite too far for the insect to travel from the other houses; village very scattered, of about one thousand very poor souls, plus farmers. The second house, in the same county, is quite shut off from the village, has an entrance drive and shrubberies, but no house or buildings within one hundred yards. The third house, in Lincolnshire, is opposite the village church, with farm buildings and cottages around it; a population of not over four hundred. No store or warehouse was near any of the three. She suggests the importation in boxes of dry provisions from London, though owning none such occurred to her while in a Yorkshire country house; and we, who get such from the Army and Navy Stores, have no cockroaches in rural Suffolk.

Canada has given us more than one good lead lately, and we here tender her our sincerest jealousy, upon hearing the announcement that she is about to publish a detailed Catalogue of the whole of her insects. It has been our pet wish, since we began to attack all orders of British insects—not less than twenty years ago, be it softly said—that there were some sort of a general guide to the numbers occurring with us. The compilation of such figures is not the easy matter a one-order entomologist may presume. Who, for instance, can yet supplement Denny's obsolete account of the Philopteridæ or Anoplura; can Theobald yet count the Aphididæ or Bagnall our Thrips? This was the principal motive for our compilation of the Chalcididæ Catalogue; and the Proctotrypidæ have been touched only by Chitty since 1873. When working on the Victoria History, we attempted a general conspectus, which was roughly:—

Coleoptera	3264	
Hemiptera	1233	(computing Anoplura at 211)
Orthoptera	53	
Neuroptera (*s.l.*)	443	
Lepidoptera	2100	(total hard to come at!)
Hymenoptera	4830	
Diptera	2577	(excl. italics in Ver. List)
	14500	

Two events of importance to our knowledge of the British fauna will, we trust, take place ere long. These are the completion of his very excellent account of the Sawflies by the Rev. F. D. Morice, and the publication by our highest authority upon Heteroptera, E. A. Butler, B.A., B.Sc., of his close investigations into the life-histories and metamorphoses of these most economically injurious insects, of which we are really very ignorant, considering their ubiquity. Douglas and Scott told us little of their earlier stages, because little was known in 1865; and Saunders in 1892 was deplorably tied down by his publishers.

The extent of sleeping-sickness is yet unknown. Bruce, Hamerton, and Bateman have some interesting observations in the Proc. Royal Soc., and find that the water-buck, bush-buck, and reed-buck can easily be infected with the human strain of this disease, Trypanosoma gambiensis, by the bite of the fateful *Glossina palpalis*. Subsequent investigation, however, failed to reveal a trace of the parasites in the antelopes' blood, yet, even more remarkably, the infected animals can transmit the parasite to clean flies, even as long as eighty-one days after the latest attack upon the host by an infected fly. The previously clean fly is, too, capable of passing the virus on to other hosts, so that these bucks, living in districts inhabited by *Glossina*, become potential reservoirs of sleeping-sickness. We anticipate that Mr. Newstead, who is now upon the spot, will find a large proportion of indigenous animals to carry the disease.

C. M.

NOTES AND OBSERVATIONS.

SPHINX CONVOLVULI REARED FROM THE EGG.—In the note sent for publication, on October 24th, I mentioned that I had reared *S. convolvuli* from ova to pupa (Entom. xliv. p. 407). I have now to record emergence of the moths. The pupæ were kept in a temperature of 75°, and on November 7th one imago appeared, another emerged on the 8th, followed by two imagines on the 19th.—G. NOBBS; North Lodge, E. Cowes, Isle of Wight.

CUCULLIA UMBRATICA REARED IN SEPTEMBER. — From ova obtained from a wild female of *Cucullia umbratica* in June of this year a number of the larvæ fed up and pupated in August, and it may be interesting to record that two specimens emerged during September. The other pupæ are going over as is usual.—T. ASHTON LOFTHOUSE; Linthorp, Middlesbrough, December, 1911.

CYANIRIS ARGIOLUS AT READING.—This species was seen in the garden on May 7th last, and a recently emerged specimen was found on a leaf of holly.—H. L. DOLTON; 21, Brunswick Street, Reading.

ENDROMIS VERSICOLOR IN OCTOBER.—On October 17th, 1911, I found in my breeding cage a female *versicolor* which had pupated near Aviemore in July, 1909. For two winters it has been subjected to a temperature of 90° to 140° F. and has finally emerged after exposure to cold air on frosty nights in October. This seems to be worthy of record as an unusual time of emergence.—CHARLES MELLOWS; Bootham School, York, November 2nd, 1911.

FORMALIN A REMEDY FOR MOULD ON CABINET SPECIMENS.—There is no doubt that the above is an excellent remedy for mould, but I would warn entomologists who may be tempted to use it that it is almost impossible to relax an insect that has at any time been subjected to it. I speak from bitter experience, as quite half a large collection of Lepidoptera brought home from the tropics was quite ruined, in spite of the skill and care exercised by an experienced setter.—N. MANDERS, Lieut.-Colonel; London.

ABNORMAL EMERGENCE OF PIERIS RAPÆ.—Yesterday afternoon (December 19th), when passing a greengrocer's shop here, I noticed a *Pieris rapæ* on the inside of the window. Entering the shop, I boxed the specimen, and found it to be a freshly emerged female of the spring form.—(Rev.) J. E. TARBAT; Fareham, Hants.

NOTES ON "MICRO" LEPIDOPTERA IN SOUTH DEVON.—In the course of a short visit to Paignton early in August, 1911, I took the following "Micros" near Paignton:—*Pyrausta aurata*, *P. purpuralis*, *Botrys asinalis*, *Pterophorus monodactylus*, *Crambus geniculeus*, *Tortrix unifasciana*, *Peronea sponsana*, *P. schalleriana*, *P. variegana*, *Eupœcilia angustana*, *Depressaria arenella*, *D. subpropinquella*, *D. applana*, *D. albipunctella*, and *Bryotropha terrella*, not a large list, certainly, but the weather was not conducive to much energy. Mr. E. A. Atmore has kindly helped to identify doubtful specimens. I was fortunate in capturing a good specimen of *Aventia flexula*, which flew out of a hedge I was beating.—G. W. MASON; Barton-on-Humber.

LEPIDOPTERA AT BURNLEY.—On June 6th I captured a specimen of *Cidaria silaceata*, which is new to our local list. On June 10th I took a male *Nemeophila plantaginis*, a species I had not seen here for several years. On August 26th *Celæna haworthii* was fairly common on the moors, also a few *Polia chi*, but the season seems to have been a bad one for the latter here. By September 4th both *C. haworthii* and *P. chi* were very nearly over, while *Tapinostola fulva* was flying at dusk, and *Oporabia filigrammaria* was found on rocks and walls. According to previous dates all those moorland species were a fortnight earlier than usual.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

LEPIDOPTERA AND ODONATA IN SOUTH CORNWALL.—A list of Lepidoptera seen or taken during last August in the Penzance district may be of interest. With the exception of one dull rainy day, the whole period was fine and hot, with brilliant sunshine during the daytime. During the first half of the month attention was chiefly directed to the district of the Try Valley, lying midway between Penzance and Gurnard's Head. Of butterflies, *Lycæna alexis*, *Chrysophanus phlæas* (one nice dark specimen), *Epinephele tithonus*, *Pararge egeria*, *P. megæra*, and *Satyrus semele* were common, together with all three

Pierids and a few *Cœnonympha pamphilus*. A fair sprinkling of *Pyrameis atalanta* was noticed on the flower-heads of *Eupatorium*, several *Vanessa urticæ*, and one or two worn *Argynnis paphia*. No varieties of *E. tithonus* similar to the Millook specimens were noted. At sugar the following insects were observed: *Axylia putris*, *Luperina cæspitis*, *Leucania pallens*, *L. lithargyria*, *Acidalia marginepunctata* (*promutata*), *Rusina tenebrosa*, *Luperina testacea*, *Charaxes graminis* (abundant), *Plusia festucæ*, *Triphæna ianthina*, *Noctua plecta* (abundant), *Agrotis saucia*, *A. segetum*, *A. suffusa*, *Plusia chrysitis*, *Gonoptera libatrix*, *Caradrina cubicularis*, *Noctua c-nigrum* (common), *Stilbia anomala* (one male), *Euplexia lucipara*, *Eupithecia jasioneata* (two worn), *E. virgaureata* (3), *Hydrœcia micacea*, *Calymnia affinis* and swarms of *Phlogophora meticulosa* and *Plusia gamma*. *Neuronia popularis* was a pest at light, flying punctually at 9.30 every evening. The dragonflies *Cordulegaster annulatus* and *C. virgo* were common along the course of the River Try. One of the former species hovering poised above the water was observed to fly *backwards* every now and then in small vertical arcs, having a versed sine of about six to nine inches. When performing this evolution the wings appeared to vibrate much more rapidly than during the forward flight; this particular specimen when captured was engaged in eating a small crambid moth (? *tristellus*). The latter half of the month was devoted to working the cliffs. A sprinkling of *Polia nigrocincta*, both male and female, turned up at sugar between 8 p.m. and 8.30 p.m. One *Bryophila perla* and *B. glandifera* at rest on rocks. Some half dozen larvæ of *Sesia musciformis* (*philanthiformis*) were extracted from clumps of thrift, three larvæ being obtained from one plant. Curiously enough, the dwarf meagre plants did not appear to be tenanted, and many of them growing in chinks of rocks appeared to have succumbed to the heat. *Jasione montana* abounds in the district, and several larvæ of *Eupithecia jasioneata* were taken from the seed heads. By far the largest number was met with inland, away from the cliffs. The larvæ of this species appear to move from one seed head to another in the evening, commencing about 7.30 in August, but this migration also seems to take place in the morning about 7, when there has been an early shower, and the seed heads of *Jasione* have become soaked. A tenanted or former tenanted seed head can be instantly detected by the "give" of the crown when taken between the finger and thumb. The larvæ varied considerably in colouring. Ivy blossom was all but out on August 30th. The temperature each evening about 8 o'clock varied between the limits of 68° F. and 75° F., the average humidity at the same time being 59.—G. B. Kershaw; West Wickham, Kent.

Notes on Lepidoptera in the Porchester district of Hants.—It might be of interest to record a few of the captures in this locality during the past summer, which has been an unusually good one for light, though sugar was completely useless till the second week in August. At light the most prominent were: *Smerinthus ocellatus*, June 3rd; *Phragmatobia fuliginosa*, July 30th; *Drepana hamula*, May 17th; *Notodonta dictæa*, May 18th; *N. trepida*, May 27th; *Drymonia chaonia*, May 17th; *D. dodonæa*, May 31st; *Leucania straminea*, August 27th; *Nonagria geminipuncta*, July 29th; *Neuria saponaria*, June 29th; *Agrotis cinerea*, May 27th (this species was first observed to occur on Portsdown Hill by Mr. A. E. Bunas, of Portsmouth, who was fortunate enough to capture six specimens during this month); *Luperina cæspitis*, August 27th; *Dianthœcia carpophaga* (the very pale form), June 13th, and again in August; *Cucullia lychnitis*, May 24th; *Plusia iota*, June 30th; *Acontia luctuosa*, July 28th; *Ennomos fuscantaria*, September 12th; *Geometra vernaria*, July 7th; *Emmelesia tæniata*, August 5th; and *Lobophora viretata*, May 31st. More than one specimen of the majority of these was taken, though in each instance the earliest date of capture is given; I had a light burning in one of my upstairs windows throughout the summer, and over two hundred species were attracted.

During June the campion flowers (*Silene inflata*) growing on the hillside proved a prolific hunting-ground at dusk, *Leucania comma*, *Mamestra sordida*, *Agrotis corticea*, *Neuria saponaria*, *Dianthœcia capsincola*, *D. cucubali*, *D. conspersa*, *Hecatera serena*, *Hadena dentina*, *Cucullia umbratica*, *Plusia chrysitis*, and *P. iota*, all coming freely, whilst the large tract of forest-land around Southwick, on the far side of the hill, though only visited twice by day and three times at dusk, gave amongst others, *Argynnis euphrosyne* (including a remarkable black suffused variety), *Nemeobius lucina*, *Thecla rubi*, *Nemeophila plantaginis*, *Comacla senex*, *Cybosia mesomella*, *Drepana hamula*, *D. unguicula*, *Lophopteryx camelina* (*in cop.* on an oak-trunk), *Cymatophora duplaris*, *Leucania pudorina*, *Erastria fuscula*, *Toxocampa pastinum*, *Ellopia prosapiaria*, *Eurymene dolobraria*, *Pericallia syringaria*, *Epione advenaria*, *Boarmia lichenaria*, *Phorodesma pustulata*, and *Hydrelia sylvata*; also *Plusia pulchrina* at flowers of ragged robin (*Lychnis flos-cuculi*).

Sugar, as has before been stated, was a complete failure up till the second week in August, but between then and the first week in October over seventy species put in an appearance, including *Bryophila muralis*, *Nonagria lutosa*, *Hydrœcia paludis*, *H. micacea*, *Mamestra abjecta*, *Miana literosa*, *Caradrina ambigua*, *Dianthœcia cucubali*, *Hadena suasa*, *Xylina semibrunnea* (on September 16th), *Abrostola tripartita*, *Catocala nupta*, and several Geometers; as my "round" was confined to the limits of an ordinary "villa" garden, I was more than satisfied with the results.

Needless to say there was the usual multitude of things at dusk along the hedgerows during May, June and July, but these cannot be dealt with at length. *Chærocampa porcellus* and *Acidalia emutaria* were possibly the surprise captures among the host that was netted every night. *Sphinx convolvuli* also made its appearance at odd places in the village in September.

The usual swarms of larvæ of *Triphæna fimbria*, *Aplecta nebulosa*, *Boarmia repandata*, &c., were to be beaten at night from the sallows in the spring, whilst by day those of *Arctia villica* were to be obtained by careful searching, sunning themselves on the rough herbage below the hedgerows in most of the lanes leading up on to the down.

On the whole the district would appear to be an exceedingly interesting one, and one that would well repay careful study of its lepidopterous fauna, more especially if more time than I have at my disposal could be devoted to collecting in the earlier stages, when I have no doubt many more unexpected species would be brought to light.—Leslie H. Mosse Robinson; Margaret Villa, Porchester, Hants.

Second Broods of Agrotis Exclamationis, &c.—There are several notices in the 'Entomologist' for last year of second broods of this species, which some of the writers seem to think is an unusual occurrence. I have always considered it as a second-brood insect in this neighbourhood, and should be much surprised if I did not meet with it at sugar in August and September. It is generally very abundant, but this year was not as plentiful as usual, though some other double-brood species simply swarmed, and this was quite a feature of the past abnormal season. The moth which in point of numbers headed the list was *Leucania pallens*; it began to appear about the middle of August, and on the night of the 26th every sugared post was covered with them; there was a large proportion of the red variety amongst them, and a great many were remarkably small examples, one or two being the smallest I have ever met with, being only one inch in expanse of wing. The following were also very abundant, in the order they are named:—*N. c-nigrum*, *N. rubi*, and *A. puta*, and of other second-brood species, *A. segetum*, *N. plecta*, *P. meticulosa*, *H. suasa*, *H. chenopodii*, and *T. orbona* were fairly plentiful. *T. pronuba* was seen from early June until the end of September, and I fancy it is more or less continuously brooded throughout the summer. I also noticed a few each of *H. oleracea*, *M. brassicæ*, and *A. psi*, and on September 7th one *A. rumicis*. The last-named is sometimes numerous in the autumn, and I have seen the larvæ late in October. Of Geometræ the most noteworthy was the abundance of *T. amataria*. On July 26th I found it in great numbers among broom on an old railway bank; this of course must have been a second brood. I did not note the date the first was captured, but it was some day towards the end of May. From August 23rd until the end of the month I bred about two dozen from ova laid by the July moths; this would be a third brood, and at the same time the moths were swarming in openings in woods where there was a strong growth of *Chenopodium*. I had a large number of larvæ from three or four different females, but most of these are hybernating. *A. emarginata* was more numerous than I have ever seen it, and was most abundant towards the end of July, at which date they were much worn—these I have no doubt were a second brood. Some ova were obtained, and the larvæ fed up rapidly, and were full grown by the beginning of September. The first moths emerged on the 21st of that month, and the last on October 17th—about forty were bred; these would be a third brood. *A. dimidiata* was also very plentiful. I have no note of the date the first was seen, but I obtained a few ova about the middle of July; the first moth appeared on August 21st, and the last September 21st; none of the larvæ attempted to hybernate. *A. incanata* was abundant throughout the summer. I fancy there is always a succession of broods of this little species. The last was noticed on September 14th. *A. emutaria* was very scarce; it is much rarer here than formerly on account of the encroachments of the sea and the destruction of the sea-banks and contiguous marshes. I netted the first on July 4th, a male; trod up a female on the 8th of the same month, and obtained a small batch of ova which hatched on 22nd, and another female a few days after I took the first one, and got another laying. About half a dozen of the larvæ fed up rapidly, and the moths emerged the end of August, but the bulk of the larvæ are hybernating. Of other species of Geometræ the second broods of *C. ferrugata*, *C. unidentaria*, *E. pumilata*, and *E. oblongata* swarmed, and I found the larvæ of the last in great abundance upon chamomile when I was sweeping for larvæ of *C. chamomillæ* on July 6th.—Gervase F. Mathew; Lee House, Dovercourt, December 18th, 1911.

Butterfly Notes from Heidelberg.—From July 14th until August 3rd, 1911, I was on a visit to Heidelberg, and, although not systematically working the district, the following notes on the butterflies met with may be of some interest. During the whole period the weather was intensely hot; the shade temperature in the town on more than one occasion rose to over 100° F., and the sun shone brilliantly every day. The collecting grounds may be roughly classified thus:—(1) The forest-covered hills on both sides of the Neckar, including on the left bank the Königstuhl (1865 ft.), the Geisberg (1230 ft.), with the small intervening valley, the Klingenteich, running down to the town; on the right bank the Heiligenberg (1455 ft.). These hills are clothed with beech, chestnut, and pine woods, with some oak and other forest trees. There is practically no open land. On the lower slopes on the Heiligenberg are some vineyards and many fruit orchards. (2) The lower lying ground between the woods and the banks of the Neckar, extending up the river valley. This land is cultivated and grass land. (3) The level cultivated land of the Rhine plain beyond the mouth of the Neckar Valley. Arriving late in the afternoon, I found the garden of the hotel swarming with *Pararge egeria*, its markings being well defined and light in colour. Subsequent experience showed that this species far outnumbered any other butterfly seen. It was everywhere—in town, woods, gardens, hills, and valleys—and could not be got away from. In one lane, where some fruit had fallen, it swarmed so much that the insects were jostling one another to get at the rotten fruit. *Pieris brassicæ* was abundant generally, but *napi* was the predominant white, chiefly of a richly marked form. Although many "whites" were netted on suspicion and released, I am not sure that I actually identified a single *rapæ*; at any rate, they were relatively rare. In the gardens also *Polygonia c-album* was the characteristic Vanessid. It looked very brilliant in the sunshine, but evidently a little *passé*, as it was difficult to get perfect specimens. *Gonepteryx rhamni* occurred generally, more common in some of the woods, but most in the plain, especially where clover or veitch was cultivated. An occasional *V. io* appeared in the garden.

Visits to the Heiligenberg on July 17th and 18th were interesting. In the woods at lower levels a few *E. hyperanthus* were met with, but was not common, possibly over. *Cyaniris argiolus* about some ivy. *Chrysophanus phlæas*, *H. sylvanus*, *P. egeria*, everywhere, even in the darkness of the pine woods. *P. c-album* here and there, but more common within easy distance of orchards and gardens. At the summit of the Heiligenberg is the ruin of St. Michael's basilikon, forming a small space in the otherwise dense woods. This space formed a sort of sun bath for the insects from the surrounding woods to enjoy themselves in, and in an hour or so spent here most of the species could be reviewed. *Papilio machaon* in fresh condition dived down from the tree tops at one end and traversed the open space low down, rising again at the other end to depart over the ruined tower. A single *L. sinapis* was taken here. *Zephyrus quercus* came from the trees and flew about the ruins. *P. megæra* also on the walls. One or two *Epinephele ianira* occurred near here, but altogether I saw very few in the whole district. From the top of the view tower it was an interesting sight to watch with a field glass the numerous specimens of *P. machaon* flying about and resting on the tops of the chestnut trees. (A fine full fed larva of *Deilephila euphorbiæ* was picked up crossing a forest path.)

A visit to the Geisberg on July 22nd added *Argynnis paphia* to the list, also *Satyrus semele* and *Vanessa urticæ*. (*Psilura monacha* common on tree-trunks in pine woods.) On the same afternoon, while in the churchyard at the old town of Dilsberg, a fine male *Apatura iris* floated in front of me, and in the valley at Neckarsteinach *Araschnia levana* turned up, also several Theclas and "blues," but having no net handy I was unable to take them for identification. A single *Colias hyale* was subsequently taken on the river bank.

On July 24th I explored the cultivated land of the Rhine plain beyond Neuenheim. Here one had the rough cart roads between the orchards and patches of corn, clover, &c.; also railway banks, the banks of the Neckar, and a few dyke or drain sides. Certain butterflies were very numerous, especially on the clover or veitch. These patches were alive with, roughly in order, *P. napi*, *P. brassicæ*, *G. rhamni*, *C. hyale*, of which a good series was soon obtained in perfect condition. An occasional *Vanessa urticæ*, and *V. io*. Also about the banks and roads were taken *P. machaon*, *P. megæra*, *P. egeria*, *H. sylvanus*, *H. linea*, *L. alexis*, and an occasional *C. pamphilus*. On this date *V. antiopa* was first seen.

July 26th, over the Heiligenberg to the valley of Siebernmuhlen. Several *V. antiopa* in fine fresh condition were noted, and *V. io* and *V. urticæ* getting more common. In one spot where the wood had been partially cleared *L. sinapis* was found abundant and fresh. *Egeria* still common, but getting shabby. *Megæra* increasing. *Lycæna argiades* taken on a rough bank by the roadside.

July 27th *P. mæra* appeared in the hotel garden, and was soon common in various localities, in company with the now abundant *P. megæra*.

On July 28th, and other occasions, the Klingenteich valley behind the town was visited: a small, partially open spot a little below the Molkenkur was found an excellent hunting ground. Besides many species already mentioned, *Zephyrus betulæ* was taken, and several

A. levana (*prorsa*). It was almost pathetic to watch the insects trying to get some moisture out of dried-up stream beds. In one spot near here there had been a slight leakage from a water-pipe by the roadside, causing a moist patch in the dust. Here assembled were three *V. antiopa*, some other common butterflies, and possibly thousands of small and large dipterous and other thirsty insects. *V. atalanta* appeared on July 29, and *antiopa* was now common. On the Königstuhl, near the Kohlhof, a solitary *A. latonia* was netted, and walking thence to Neckargemund, many species were found common. From Neckargemund along the low-lying land bordering the Neckar as far as Schlierbach are several favourable spots for collecting, but owing to the drought the grass land was so scorched that no doubt conditions were not so favourable. A visit earlier in the season would be more productive of Lycænidæ, &c. The usual clover insects were seen, also *P. machaon*. *L. dorilis* was netted, and also *P. semiargus*. I had no other opportunity of returning to this rather promising locality. I find that my total list of butterflies taken or noted amounts to thirty-two, and this no doubt might have been extended considerably by further exploration and information as to localities. My collecting was limited to what could be done during morning walks in the near neighbourhood, and as it was almost my first experience of Continental butterfly hunting, it proved of much interest to me. There may be some readers of similar limited experience whom these rough notes may interest.—E. Octavius Croft, M.D., F.E.S.; 28, Clarendon Road, Leeds, August 31st, 1911.

Collecting in North Devon in 1909–1910.—Having had the privilege of spending some short holidays at an out-of-the-way spot in North Devon, some notes of my captures may be of interest. My first visit in 1909 only extended over three days, May 29th, 30th, and 31st, but the weather being fairly propitious, the following species were taken or noticed:—*Eupithecia pulchellata*, *Camptogramma fluviata* (taken after a rain-storm at 3 p.m. at rest on flowers of *Anthyllis vulneraria* growing on the cliffs on the shore). I believe this species is very seldom found in the perfect state. *Sericoris littoralis* flying amongst *Statice armeria*, *Pyrodes rhediella* flying in the morning sunshine over hawthorn, *Phalonia* (*Eupœcilia*) *atricapitana* amongst ragwort (*Senecio jacobææ*), *Adela fibulella* sunning itself on the flowers of the germander speedwell (*Veronica chamædrys*), *Chrysoclista aurifrontella*, *Lampronia luzella* (on the wing at 11 a.m.) and several larvæ of *Lasiocampa quercus* feeding on bramble in the hedgerows, and also larvæ of *Ebulea crocealis* on the leaves of *Inula dysenterica*. Quite a feature of the said hedgerows were the flowers of the red robin or campion (*Lychnis diurna*), which I had never previously seen so brilliant or luxuriant. My second visit in the same year extended from July 27th until August 14th. In the morning of July 28th on some rough ground above the cliffs I took *Aristotelia* (*Monochroa*) *tenebrella*, *Satyrus semele*, *Acalla holmiana*, and *Epiblema trigeminana*, whilst in the afternoon in a typical Devonshire lane I netted one *Lampronia luzella* (presumably a double-brooded species) flying in the sunshine, and beat one *Lithosia complanula* out of a hawthorn hedge. In the evening amongst ragwort on the sandhills, two worn specimens of *Cydia nigromaculana* were taken at dusk. The next day my exertions were rewarded with *Euxanthis zœgana*, *Pyrausta stachydalis* (disturbed at mid-day from a mass of tangled herbage including bracken, *Stachys sylvatica*, &c., growing at the back of the sandhills), *Notarcha ruralis*, *Alucita lithodactyla* at rest on a flower of *Inula dysenterica* and *Recurvaria* (*Brachycrossata*) *cinerella* amongst grass on the sandhills. On July 30th, in the lanes near the sea, *Phalonia rupicola* was taken on the hedge near *Eupatorium cannabinum*; *Notocelia roborana* and *Epiblema trigeminana* were beaten out; and on the sandhills amongst ragwort I netted *Phalonia atricapitana* and several *Coleophora laripennella*; amongst heather a male *Plebeius argus* (*ægon*), *Peronea aspersana*, and *Pseudopanthera obscuraria*; and amongst marram grass *Gelechia politella* and *G. marmorea*. On July 31st, in one of the aforesaid lanes bordered with furze bushes on one side and blackthorn on the other, two fresh specimens of *Phalonia* (*Argyrolepia*) *badiana* were boxed as they sat on the furze in the afternoon between 3 and 4 p.m. Subsequent search revealed the food-plant *Arctia lappa* in an adjoining meadow. Another specimen of *P. badiana* was netted at 8 p.m. in a lane near by. Other captures that day were *Hydriomena decolorata*, *Orneodes hexadactyla* (*polydactyla*), *Euxanthis* (*Xanthosetia*) *zœgana*, *Eurhodope* (*Rhodophæa*) *advenella*, *Acalla* (*Dictyopteryx*) *holmiana*, and *Epiblema* (*Ephippiphora*) *trigeminana*. The morning of August 1st was wet, but the heavy downpour ceased about 1 p.m., and by 2 p.m. the sun was struggling to shine through the mist. A female *Lasiocampa quercus*, newly emerged in a cardboard box covered with leno, being placed in the window of a front room overlooking the sandhills, attracted several males, of which ten were taken either in the room or just outside the window. In the evening between 9 and 10, at flowers of ragwort, *Agrotis tritici* (variable), *Triphæna interjecta*, *Caradrina alsines* and *Leucania pallens* were secured. Other species observed included *Catoptria cana* and *Gelectria domestica*. On August 2nd in the lanes about a mile inland the beating stick dislodged *Hydriomena* (*Melanippe*) *unangulata*, *H. dotata* (*pyraliata*), *P. badiana*, *Eupœcilia roseana*, *Stigmonota compositella*, *A. holmiana*, and *E. trigeminana*, and in the evening, *Brachmia gerronella* and *Idiographis inopiana* (flying low just before 9 p.m. amongst *Inula dysenterica*).

August 3rd produced several specimens of *Acalla holmiana* (beaten from blackthorn bushes at the back of the sandhills), *Euchelia jacobææ*, *Lampronia luzella*, *H. unangulata*, *Depressaria purpurea*, *Crambus perlellus*, *Blabophanes ferruginella*, *Symmoca* (*Œcogenia*) *quadripuncta*, *Coleophora laripennella*, and *Lithocolletis faginella*. The next day *Anthrocera filipendulæ*, *A. holmiana*, *Stigmonota compositella*, and *Gracilaria tringipennella* amongst ribwort plantain (*Plantago lanceolata*) were taken. The only capture of note on August 5th was *Stenia punctalis*—six specimens of which were secured on the cliffs at sunset. The next day three *Tinea argentimaculella* were taken flying at about 6 p.m. over an old wall about a mile from the coast, whilst a little further on at the roadside *Coleophora discordella* was netted.

August 7th was one of the hottest days of the year, and a visit to the sandhills resulted in the capture of *Crambus uliginosellus* (disturbed from the clumps of tall rushes), *C. tristellus*, one *Anthrocera filipendulæ* var. with a pink hind wing, *Peronea aspersana*, *Phalonia roseana*, *P. atricapitana*, *Sciaphila conspersana*, *Tortrix ictericana*, and *Symmoca* (*Œcogenia*) *quadripuncta* on the wall inside the lighthouse. On August 8th in the evening I took *Sericoris littoralis* amongst *Statice armeria* on the cliffs. I visited the sandhills again on the 9th at dusk and took *Alucita lithodactyla*, *Crambus uliginosellus*, *Phalonia* (*Eupœcilia*) *atricapitana*, *Depressaria alstrœmeriana*, and *Acrolepia granitella*. *Dicrorampha simpliciana* was flying freely amongst *Artemisia vulgaris* at 8 p.m. on the 10th and a good series was soon boxed, and earlier in the day *Ennychia cingulalis*, *C. nigromaculana*, and *Œcophora lambdella* were the best species obtained. The only new species noticed on the 11th was *Depressaria subpropinquella*. On the 12th a further visit to the sandhills only produced *Crambus geniculeus* in addition to those species already mentioned. As we were leaving the next day, the 13th was devoted to setting my captures and packing up. After doing so a final walk round the cliffs added *Acidalia marginepuncta* and *Adactylus* (*Agdistis*) *bennetti* to my list. The latter was flying between 8 and 9 p.m. amongst the spathulate sea lavender (*Statice binervosa*). It was very much paler than specimens from Mr. Ovenden, of Rochester, and appeared to be the form described by Mr. Tutt (vol. v. p. 137) as (2) Whitish grey with four black dots on the disc = ab. *grisea typica*, n. ab. This species does not appear to have been previously recorded for Devon. We had no rain after August 1st, the weather being brilliantly fine during the remainder of our visit. In 1910 I was prevented from visiting the neighbourhood until July 29th, and between that date and my return home on August 12th, the following species were taken, in addition to most of those already mentioned :—*Hypermecia angustana*, *Gelechia domestica*, *Butalis grandipennis* (on the road below a bank where some dwarf furze bushes grew), *Hedya aceriana* (at rest on white poplar trees and fences in a garden), *Argyresthia albistria*, *Lita maculea* (beaten from hedge in a lane), *Coleophora alcyonipennella* (brought into the house amongst knapweed flowers), *Eupithecia coronata*, *Phalonia rupicola*, *Cerostoma vittella*, *Laverna atra*, *L. ochraceella*, *Stigmonota compositella*, *Chrosis alcella*, *Lithosia complanula*, *Prays curtisellus*, *Argyristhia andereggiella*, *Peronea variegana*, *Catoptria ulicetana*, *Lithocolletis emberizipennella*, *Anerastia lotella*, *Selenia bilunaria*, *P. obscuraria*, *Eubolia bipunctaria*, *Depressaria nanatella*, *D. applana*, *Homœosoma sinuella*, *Ochsenheimeria birdella* (on bedroom window curtain at 7.30 p.m., a very unusual time and place for this species), *Penthina gentiana* (on the wing at 1 p.m. amongst teazle), *Orthotænia ericetana* (in a clover field in the afternoon), *Mimæsioptilus bipunctidactyla*, *Miana literosa* (at ragwort flowers at 7 p.m.), *Spilonota incarnatana* (sitting on the leaves of *Rosa spinosissima* at sunset), *Coleophora albitarsella* (at rest on a fern leaf in a hedge in the afternoon), *C. laricella*, *Crambus inquinatellus*, *Xylophasia rurea*, *Miana bicoloria*, *Gelechia desertella*, *G. marmorea*, *Argyresthia spiniella*, *Eucosoma* (*Catoptria*) *scopoliana*, *E. fulvana*, *E. expallidana*, *Elachista atricommella*, *E. nigrella*, and *E. subnigrella*. The weather was most unfavourable, rough winds and rain prevailing most of the time. In fact August 10th was the only day during the fortnight free from rain: it was brilliantly fine, and about the hottest day experienced during a very disappointing summer. In conclusion, my grateful thanks are due to Mr. Edward Meyrick, F.E.S., for his kindness in identifying many of the species.—C. Granville Cluttebuck, F.E.S.; Heathside, Heathville Road, Gloucestershire, November 13th, 1911.

Erratum.—Entom. xliv. p. 381, 18th line from top, read: to the *posterior* surface of the mesothorax, instead of *posterior* centre of the anal segment, in next line.

SOCIETIES.

Entomological Society of London.—*Wednesday, October* 18*th*, 1911.—The Rev. F. D. Morice, President, in the chair.—The following gentlemen were elected Fellows of the Society:—Mr. Sidney Howard Cotton, 1a, Chesterfield Street, Mayfair; Captain J. J. Jacobs, R.E., 2, Southport Street, Gibraltar; Mr. Kunui Khunan, M.A., Assistant Entomologist to the Government of Mysore, Bangalore, South India; Dr. Ivan Clarkson Maclean, M.D., B.Sc., M.R.C.S., L.R.C.P., 28, Hill Street, Knightsbridge, S.W.; Mr. Frank Taylor, The Technological Museum, Sydney, New South Wales.—Dr. F. A. Dixey exhibited a pair of each of the following species:—*Tachyris melania*, Fabr., *T. celestina* and *Catophaga ega*, Boisd., and remarked that Fabricius's type was preserved in the Banksian Cabinet, where it may still be seen, and that Mr. G. A. Waterhouse has now sent home specimens which are undoubtedly of the species described by Fabricius and represented by Donovan, which is not a *Catophaga* allied to *ega* or *paulina*, but a *Tachyris* belonging to the group which contains *T. celestina* and *T. nero*.—Mr. W. G. Sheldon, a living larva of *Colias nastes* var. *werdandi* which he had bred from an ovum deposited by a female captured at Abisko, in Swedish Lapland; the natural food-plant is *Astragalus alpinus*, L., but in captivity the larva fed upon white clover. — Mr. W. J. Lucas, two specimens of *Nemoptera bipennis*, Illig. (*lusitanica*, Leach), taken by Mr. A. H. Jones; one in the cork woods at Almorima, Spain, on May 5th, 1911, and the other at Linea, Gibraltar, on the 28th; also a specimen of *Lertha barbara*, Klug. taken by Mr. H. Powell at Aflou, Oran, Algeria, on June 30th, 1911. Mr. Lucas also exhibited a large specimen of *Sirex noctilio*, taken by himself at Leith Hill, Surrey, walking on the road, on September 8th, 1911.—Mr. H. St. J. Donisthorpe, a species of Coleoptera new to Britain, *Lesteva luctuosa*, Fauvel, which he had taken in moss in a waterfall on the high ground in the Isle of Eigg, near Mull, on September 17th, 1911.—Mr. H. M. Edelsten showed some bred specimens of *Erastria venustula*; the larvæ had fed readily on flowers of *Potentilla tormentilla*, and on garden forms of *Potentilla*, strawberry, and bramble blossoms, and later on lettuce leaves, which they seemed to prefer. They pupated below the surface of the ground in a strong cocoon.—Mr. K. G. Blair exhibited a male and two females of a "stick-insect" (? *Lonchodes* sp.), which is usually parthenogenetic. Mr. C. O. Waterhouse said he had bred three generations of this Phasmid and had had many hundreds of specimens, and he congratulated Mr. Blair on having the only male he had ever seen or heard of.—Dr. K. Jordan exhibited forty-six forms of *Delias* from three mountain-ranges of New Guinea. Whereas in other districts of the Oriental Region at the most seven or eight species (generally four to six) may be found in any locality, a surprising number are met with in the mountains of New Guinea from 3000 or 4000 ft. upwards. In suitable localities of the Owen Stanley Range no fewer than twenty-four species have been obtained, of which eighteen are confined to the higher altitudes.—The Rev. A. Miles Moss, the following Sphingids from Para:—*Amphimœa walkeri*, *Isognathus excelsior*, *Grammodia caicus*, with pupa spun up in a leaf; *Hemeroplanes inuus*, *Epistor gorgon*, male and female; *Pholus phorbas*, *Xylophanes nechus*, with chrysalis, and *X. cosmius*, female, the first known specimen of this sex.—The President mentioned that the University of Cambridge had decided to appoint a Demonstrator in Medical Entomology.

Wednesday, November 1st.—The Rev. F. D. Morice, M.A., President, announced that the Council proposed Fr. Eric Wasmann, of Valkenburg, Holland, as Honorary Fellow in the place of the late Herr P. C. T. Snellen, of Rotterdam, and Prof. J. H. Comstock, of Cornell University, U.S.A., for the vacancy caused by the death of Dr. S. H. Scudder, of Cambridge, Massachusetts, both of whom were then elected. The following gentlemen were elected Fellows of the Society:—Messrs. T. J. Anderson, Teaninich, Craig Millar, Midlothian; Edward Bernard Ashby, 33, Park Road, Whitton, Middlesex; W. A. Lambourn, M.R.C.S., L.R.C.P., Omi Camp, Lagos, West Africa; J. Jackson Mounsey, 24, Glencairn Crescent, Edinburgh.—Dr. Nicholson showed a specimen of *Aleochara discipennis*, Muls. and Rey, taken in the early part of this year from moss in a small wood at Alphington, Devon.—Mr. J. R. le B. Tomlin, a teratological specimen of the rare beetle *Triarthron maerkeli*, swept in the Wellington College district this summer. It has the two last joints of left antenna completely soldered together, making a two-jointed instead of a three-jointed club. Also a specimen of *Longitarsus melanocephalus* (?) taken by Mr. J. Collins at Oxford, with legs and tarsi remarkably thickened.—Mr. W. J. Lucas, five specimens, three males and two females, of *Panorpa germanica*, taken by Col. Yerbury, four at Dingwall in May and one at Lochinver in July. One male is practically immaculate, and the other two nearly so; the female from Dingwall is sparsely spotted, while the one from Lochinver is more nearly normal.—Mr. C. J. Gahan, a living specimen of *Aspidomorpha silacea*, Boh., an African species of Cassididæ, which had been sent by Mr. G. St. John Mildmay from Nyali in British East Africa on October 7th, reaching London on October 28th.—Dr. K. Jordan announced that the Polyctenidæ contained in the collection of the British Museum, which are parasitic on bats in the tropics, are viviparous like the parasitic Orthopteron *Hemimerus*. The young are born at a very advanced stage, but yet differ considerably from the adult. Two of the forms (*spasmæ* and *talpa*) described as distinct species, and lately placed in two different genera, are immature and adult examples of the same species.—Mr. Harwood exhibited two specimens of *Micrurula melanocephala* taken near Bishop's Stortford by sweeping in the evening, which he believed to be var. *brunnea*, Heer; also two specimens of *Ocypus cyaneus* taken by Mr. W. H. Harwood at Colchester, one in May and the other in June of this year, the first specimens taken in the district for nineteen years; also a species of *Coccinella* taken in a case of Tasmanian apples at Colchester.—Mr. H. Eltringham, specimens of African Acræas, to show that wide differences of colour and pattern may occur in a single species, and, conversely, that certain species which can scarcely be distinguished by their outward appearance are nevertheless very distinct, as shown by the structure of the male armature. Several new species and forms were also shown, including *A. lofua*, Eltr., male and female; *A. grosvenori*, Eltr., male; *A. aureola*, Eltr., male; *A. ella*, Eltr., male; *A. cinerea* subsp. *alberta*, Eltr., male; *A. periphanes* f. *acritoides*, Eltr., male; and *A. astrigera* f. *brunnea*, Eltr., male and female. Dr. Jordan remarked on the extreme variability of the genus and its allies, geographically, individually, and even in the characters of the genitalia.—Mr. Bethune-Baker remarked on the unreliability of the genitalia in certain Lycænidæ.—The President stated that the male genitalia were, as a rule, reliable in the Aculeata, but in the Tenthredinidæ the male genitalia were quite useless for specific determination, though the females afford excellent characters.—The Hon. Walter Rothschild remarked on the identity of the male genitalia in certain distinct species of Macroglossinæ.—Com. Walker read a paper on "The Effect of Temperature on Animal (especially Insect) Life," by A. G. Butler, Ph.D., F.L.S.—The following papers were also communicated:—"Parthenogenesis in Worker Ants, with special Reference to two Colonies of *Lasius niger*, Linn.," by W. C. Crawley, B.A.; "A Monograph of the genus *Acræa*," by H. Eltringham, M.A., F.Z.S.—GEORGE WHEELER, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*October* 12*th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. H. R. Sweeting, M.A., of S. Woodford, was elected a member.—Mr. W. J. Kaye exhibited bred and captured series of *Lithosia deplana*, in which some of the former were much darker than usual.—Mr. Barrett, three series, one taken many years ago, one in 1909, and one this year; the 1909 were generally darker in colour but not so dark as Mr. Kaye's bred specimens, although several specimens were without the yellow costa of the fore wings.—Mr. Barrett, also a *Xylina furcifera* (*conformis*) taken in 1904 in the east of England, and an example bred in S. Wales in 1876, by Evan John. The latter was var. *suffusa*, Tutt.—Mr. Sich, specimens of *Gracilaria syringella* bred from *Phillyrea media*, a food-plant not hitherto recorded.—Mr. R. Adkin, an example of *Tortrix podana* bred on September 13th from a pupa taken in a shoot of *Euonymus* at

Eastbourne, and reported that the Rev. W. Claxton had reared several specimens in mid-September.—Mr. B. H. Smith, a specimen of *Sterrha sacraria*, female, taken by him just recently near the Lizard, and a *Rumicia phlæas* with right fore wing ab. *schmidtii*.—Mr. Dods, the huge cocoons of *Philosamia cecropia*, all of which had become dark brown in colour except one which had kept its pure white colour.—Mr. Main said that the grub shown in the Coquillo nut exhibited at last meeting was that of the large "pea weevil," *Caryoborus nuctuorum*, a native of Brazil.—Mr. Blair, specimens of *Boreas hiemalis* from Stanmore Common, in Essex.—Mr. Blenkarn, many species of Coleoptera taken by him during the season, including *Clytus arictis*, *Cicindela sylvatica*, *Dytiscus marginalis*, *Aromia moschata*, &c.—Mr. Adkin and others gave their experiences of the season.

October 26th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Rev. George Wheeler, M.A., F.Z.S., F.E.S., and Mr. H. B. Wells were elected members.—Mr. Sich exhibited *Lithocolletis hortella* and *L. sylvella*, and noted their specific characters and markings.—Mr. Russell, a *Phryxus livornica* from Purley, three autumn bred specimens of *Diacrisia sanio* (*russula*) from Grange over Sands, and recorded a *Bithys quercus* taken on September 1st.—Mr. R. Adkin, a series of *Eupithecia subfulvata* bred from ova laid by a female taken at Chiswick.—Mr. Moore, a large *Cicada* taken on a window at Wanstead, and read notes on a Silphid beetle from the Orange River Colony, which in life bore an abundant waxy secretion on its elytra.—Mr. Sheldon, a long and fine series of *Colias nastes* var. *werdandi* taken by him in Lapland.—Mr. Newman, a long and varied series of bred *Amorpha populi*, with three second-brood examples.—Mr. Blair, living male and female specimens of the "stick" insect known as *Dixippus morosus*, and imagines of the rare Dipteron *Boreas hiemalis*.—Mr. Baumann, a fine melanic form of *Acidalia virgularia* from Lewisham.—Mr. Curwen, series of *Colias palæno*, *C. phicomone*, *C. hyale*, and *C. edusa* from the Swiss Alps, and also melanic forms of *Cidaria immanata*, *Hypsipetes sordidata*, and *Mania maura*.—Mr. Blenkarn, examples of three species of Coleoptera recently recognised as British, *viz.*, *Haliplus heydeni*, *H. immaculata*, and *Gabrius stipes*, from the Cotswolds, Lowestoft, and Beckenham, respectively. — Mr. Buckstone, a very remarkable *Brenthis selene* from Wanborough, with almost all the usual markings absent on the upper side.

November 9th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. H. Page, F.E.S., of New Cross, and Mr. W. S. Coxhead, of Clapton, were elected members.—Mr. South, on behalf of the Rev. A. P. Waller, exhibited a series of *Leucania* reared from ova laid by a female *favicolor*, half of which were distinctly *L. pallens*, the rest agreed with the parent or were intermediate, and numerous captured examples for comparison ; also three specimens selected from thirty *favicolor* that were reared from ova deposited by a *pallens*-like female.—Mr. Newman, a long series of *Pyrameis cardui* bred from ova and fed up in a hothouse. The female was captured at Folkestone, on September 2nd, and the last imago appeared on October 16th.—Mr. Kaye, bred specimens of *Rumicia phlæas*, forced in a hothouse from ova. — Mr. Andrews, the local Diptera *Syrphus vittiger*, *S. lineola*, and *Sciomyza simplex* from North Kent.—Mr. Adkin, specimens of *Peronea variegana* taken in or reared from his own garden, including a second-brood example on October 6th.—Mr. Tonge and Mr. Colthrup, series and specimens of *Xylina socia* (*petrificata*) and *X. semibrunnea* for comparison. One specimen of the latter species was from the New Forest.—Mr. Moore, specimens of the Tsetse Flies (*Glossina*) from the Lake Chad area, and read notes on them.—Mr. Buckstone, series of *Brenthis selene* from Surrey, one small and dark from high ground, gravel overlying chalk, mainly in July, the other large and light on low marshy ground clay, mainly in June.—Mr. Carr, a large number of Lepidoptera taken in Shropshire during 1910.—Mr. Sich, specimens of *Lithocolletis stettinensis* from Oxshott.—Mr. Tonge, lantern slides of imagines shortly after emergence of species of the genus *Ægeria* (*Sesia*), and also the ova.—Mr. J. P. Barrett, lantern slides of collecting grounds around Mount Etna.—Mr. Main, lantern slides showing details of the life-history and economy of a common millepede.

November 23*rd*.—Annual Exhibition of Varieties, &c.—The Rev. F. D. Morice, M.A., F.E.S., was elected a member.—Mr. South exhibited an extreme melanic aberration of *Brenthis selene*, a dark-banded *Zonosoma linearia*, *Rumicia phlæas* var. *eleus*, *R. phlæas* var. *schmidtii*, a fine series of varieties of *Leptogramma literana*, &c.—Mr. R. Adkin, two series of aberrations of *Abraxas grossulariata*, (*a*) from wild larvæ, (*b*) from inbreeding, a *Zonosoma orbicularia* with the whole of the wings of a rich red-brown, &c.—Mr. Blenkarn, varied series of *Amorpha populi* and *Bupalus piniaria*, and a *Brenthis selene* almost devoid of transverse markings.—Mr. Newman, a series of *Mellinia ocellaris*, including the forms similar to *M. gilvago* and *Citria fulvago*, a large number of the more striking varieties from the "Capper" collection, a lemon-tipped ab. of *Euchloë cardamines*, a *Brenthis euphrosyne* with black hind wings, a *Pyrameis cardui* with apex of fore wings largely black, fine abs. of *Agriades coridon*, &c.—Mr. A. Quarrington, *P. cardui* with conspicuous blue spots, a yellow *Polygonia c-album*, *A. corydon*, with large confluent spots, *R. phlæas* with almost obsolete marginal bands, &c. — Mr. Bright, a drawer containing all the finest extreme varieties from the collection of the late Mr. J. A. Clarke, and a drawer of varieties of *Amorpha populi*, including a magnificent gynandromorph.— Mr. Turner, a series of *Erebia æthiops* from Scotch (var. *caledonia*) and many Continental localities, a long series of *Luperina nickerlii*, including a fine series of the *gueneei* race from Mr. Baxter (St. Anne's-on-Sea), a set of the E. Pyrenean race *graslini* from M. Oberthür, and the type form Bohemia, many forms of *L. testacea* kindly sent him by the same gentleman, from France and Algeria, together with a number of *L. dumerilii* from the same localities.—Mr. Main, long and fine series of *Boarmia repandata* bred by the late Mr. Harrison and himself, the results of crossing the dark and *conversaria* forms.—The Rev. F. D. Morice, the smallest known bee, *Ceratina parvula*, and the largest bee, *Xylocopa* sp.? Gilbert White's "Hoop-shaver bee" *Anthidium manicatum*, the famous "Upholsterer bee" *Osmia papaveris*, and a Mediterranean snail-shell inhabiting bee, *O. ferruginea*, together with microphotographs of the "saws" of the sawfly genus *Dolerus*.—The Rev. J. E. Tarbat, *Gnophos obscurata* from many localities, including ochreous and almost black forms from the same place, Budleigh Salterton.—Mr. Barnett, a fine varied series of *Apamea leucostigma* and var. *fibrosa* from the Fen District.—Mr. Schooling, a second brood *Arctia caja* with only an imperfect narrow fascia and a few apical and costal spots of cream colour on the fore wings.—Mr. Colthrup, a very long series of this year's *Colias hyale* from E. Kent.—Mr. H. B. Smith, a *Melanippe montanata* almost white, *Catocala nupta* with smoky-brown hind wings, three *Agrius convolvuli* from Warlingham, with specimens of *Phryxus livornica*, *Sterrha sacraria*, *Laphygma exigua*, *Plusia ni*, and series of *Polia xanthomista*, and *Rumicia phlæas*, including a partial var. *schmidtii*, all from S. Cornwall, in September last.—Mr. Sich, the Gelechiid *Argyritis pictella*, which used to occur on Barnes Common and, for Mr. Green, *Depressaria putridella* from its N. Kent habitat.—Mr. W. G. Blair, teratological specimens, *Mimas tiliæ* asymmetrical, *Carabus catenulatus*, with reflex margins of thorax excised, and *Pimelia fornicata*, right antenna doubly branched, and, for Mr. W. N. Blair, examples of the Medicinal Leech from the New Forest.—Mr. Tonge, stereoscopic slides of lepidopterous ova *in situ* wild laid, with specimens of the imagines, genera *Trochilium* and *Ægeria*, and also varied bred series of *Cidaria truncata* (*russata*) and *Lobophora viretata*.—Mr. Pratt, an extreme dark margined form of *Ephyra pendularia*.—Mr. Baumann, *Hydriomena furcata* (*sordidata*), bred, from Surrey, with a black series from Manchester, very pale *Dianthœcia carpophaga* from the Sussex coast, &c.—Mr. Scorer, aberrations of *R. phlæas* long-tailed, spotless under side, *P. machaon* heavily banded, *Euchloë cardamines* with white streak through the orange patch, *Porthesia similis* with black edged costa, *Callimorpha dominula* with rounded wings, *P. napi* male, heavily spotted, &c.—Mr. St. Aubyn, two ab. *flava* of *A. filipendulæ* from Coulsdon.—The Rev. F. M. B. Carr, a collection made in Mid-Wales last June, including *Plusia interrogationis*, a fine varied series, *Acidalia fumata*, *Agrotis lucernea*, &c.—Mr. Andrews, dwarf Diptera, *Bombylius major*, *Eristalix pertinax*, and *Chrysochlamys cuprea*, and, for Mr. Barraud, a teratological specimen of *Spilogaster uliginosa* with missing fourth longitudinal vein.—Mr. Stanley Edwards Papilionidæ, *P. policenes* and allied *P. lurlinus* and *P. nyassinus* from Africa compared with *P. ajax* and *P. marcellus*, American.—Mr. Platt Barrett, male and female comparisons of British and Sicilian butterflies, *G. rhamni* and *G. cleopatra*, *Hipparchia semele* and var. *algirica*, *E. jurtina* var. *hispulla* and var. *fortunata*, a long series of *Euchloë damone*, sets of geographical forms of *Melanargia galathea*, British, Alpine, Apennine, Calabrian, Sicilian, at various elevations, &c.—Mr. Barnett, for Mr. Cannot, a *Wheeleria spilodactyla*, Freshwater, with no cleft in fore wings and one only in hind wings.—Mr. Kaye, an unusually large spray of the magnificent orchid *Cattleya labiata*, five flowers.—Mr. Pickett, results of breeding *Angerona prunaria* under coloured muslins, red, pink, orange-yellow and cream with green pattern, and aberrational series of *M. galathea*, *Agriades corydon* (*semi-syngrapha*, *obsoleta*, *striata*, *minor*), &c.—Mr. Sheldon, European Diurni taken by himself in the Riviera, S. Spain, Digne,

&c., including fine series of *Zegris eupheme* var. *meridionalis*, *Thais rumina* var. *canteneri* var. *medicicasti*, and ab. *honoratii*, *Araschnia levana* var. *prorsa* and var. *porima*, &c.—Mr. Frisby, nearly all the species of British bees in the genera *Andrena* and *Cilissa*.—Mr. W. J. Kaye, a drawer of species of Syntomidæ he had taken at flowers in S. Brazil, and gave notes on their habits.—Hy. J. Turner, *Hon. Report. Sec.*

Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, November 20th, 1911.—Dr. John Cotton in the chair.—Dr. P. F. Tinne read a paper on "The Application of the Lumière Process of Colour Photography to Entomology," and in the course of a most interesting address exhibited a number of colour portraits of Lepidoptera in their native haunts, as well as pictures of places he had visited when in the pursuit of insects. It is quite evident that there is a great future for this class of work as soon as coloured prints can be taken direct from the negatives.—Mr. Robert Tait, Jr., exhibited a fine lot of insects from Braemar, the results of his summer holiday which was spent in that locality. These included a very fine series of *Plusia interrogationis*, *Dasydia obfuscaria*, *Cœnonympha tiphon*, *Zygæna exulans*, *Nemeophila plantaginis*, and var. *hospita*, the last being obtained as a partial second brood in October. Varied but smaller series of the following were also shown:—*Cidaria populata*, *C. immanata*, *Coremia munitata*, *Larentia cæsiata*, and *Halia brunneata*; Mr. Tait further contributed an interesting account of his holiday with remarks upon the variation, &c., of the insects captured.—Mr. Wm. Mansbridge exhibited a series of *Polia chi*, taken in the Huddersfield district on August Bank Holiday, comprising the melanic forms for which that neighbourhood is famous.—Oscar Whittaker and Wm. Mansbridge, *Hon. Secs.*

The Manchester Entomological Society.—The first meeting of the 1911–12 Session was held in the Manchester Museum, Owens College, on Wednesday, October 4th, Mr. B. H. Crabtree in the chair. The following exhibits were made:—Mr. R. Tait, Jr., a long series of varieties of *Abraxas grossulariata*, all bred from some two or three hundred larvæ from the Huddersfield district; beautiful series of *Boarmia repandata*—a black form from North Wales, var. *conversaria* and the type from South Wales; series of *Diacrisia sanio* (*russula*), *Drepana falcataria*, *Perconia strigillaria*, *Geometra papilionaria*, *Cybosia mesomella*, from Wyre Forest, June, 1911; *Aplecta advena* from Monkswood, *A. tincta* from Wyre Forest, *Boarmia roboraria* from Monkswood, &c.—Mr. B. H. Crabtree, bred series of *Boarmia repandata* from Delamere and Cornwall, *Ennomos autumnaria* from Southend stock, *Agrotis ashworthii* from North Wales, *Mamestra dissimilis* from Manchester; also a series of *Cœnonympha typhon* from North Lancashire, *Erebia epiphron* and *Parasemia plantaginis* (with var. *hospita*) from the mountains near Helvellyn. —Mr. W. P. Stocks, a large number of species taken at Silverdale and Witherslack during June. These included, from Witherslack, series of *Cœnonympha typhon*, *Diacrisia sanio*, *Acronycta menyanthidis*, *Acidalia fumata*, *Perconia strigillaria*, &c. From Silverdale were

Chærocampa elpenor, *Nudaria mundana*, *Thyatira batis*, *Xylophasia sublustris*, *Mamestra furva*, *Aplecta nebulosa* (pale form), *Mamestra dissimilis*, *M. contigua*, *Boarmia repandata* (dark, light, and intermediate forms), *Cucullia umbratica*, &c.—Mr. C. F. Johnson, series of *Asteroscopus nubeculosa* from three-year-old pupæ; *Dianthœcia capsophila* bred from a bag of campion-pods from Howth; *Lophopteryx camelina* from ova laid on June 10th—these emerged in mid-August and had taken only ten weeks from ovum to imago.—Mr. G. Storey, the following from the breck-sand district of Suffolk:—*Dianthœcia irregularis*, *Emmelesia trabealis* (*sulphuralis*), *Acidalia rubiginata*, *Lithostege griseata*. From Wicken Fen: *Leucania straminea*, *L. impudens*, *Cœnobia rufa*, *Arsilonche albovenosa*, *Bombycia viminalis*, *Bankia argentula*, &c., and a dark variety of *Strenia clathrata*. From Cambridge: *Agrotis puta*, *Mesotype virgata*, and *Bryophila glandifera* var. *impar*. From the New Forest: *Boarmia roboraria*, *Eurymene dolobraria*, *Diacrisia sanio*, and *Hemaris fuciformis*. He also showed a female variety of *Argynnis selene* from Brockenhurst; a blue female variety of *Lycæna corydon* from Cambridge; a yellow male variety of *Cosmotriche potatoria* from Wicken Fen; a male variety of *Saturnia pavonia* from Delamere; and a fine *Melanippe fluctuata* var. *costovata* from Brooklands, Cheshire.—Mr. H. Massey, a drawer of *Xanthia aurago* from Reading and Worcester.—Mr. Wm. Mansbridge, a fine series of *Silenia bilunaria* types and var. *brunnearia* from Delamere, and a series of *Aplecta nebulosa* bred from *robsoni* parents from Delamere; these showed intermediate forms.—Mr. J. H. Watson, living larvæ, feeding on rose, of *Hylesia muscula*, a well-armed Saturnid larva from Brazil, and also a pair of imagines. Newly described forms of the Saturnidæ, viz.:—*Philosamia lunula* sub. sp. *fusca*, and *Actias selene* sub. sp. *callandra*, both from the Andaman Islands. *Caligula japonica* and *C. simla* and a hybrid between them, to which the name of *Caligula* hybrid *salmoni* has been given, after Mr. Albert Salmon, who obtained the cross. A remarkable gynandromorphous specimen of *Antheræa mylitta*, hatched from a cocoon from Bengal. In this portions of the body and sections of the wings are golden yellow like a var. *silvalica*, the rest of the insect being of the chestnut-red male colour. Portions of each antenna have both male and female pectinations; the genitalia are chiefly male, but not typical.—Mr. J. C. Cope, examples of Canadian Coleoptera of the following genera:—From Toronto: *Pterostichus*, *Harpalus*, *Amara*, *Hydroüs*, *Cybister*, *Coccinella*. From Winnipeg: *Anchomenus*, *Bembidium*, *Hister*.—Mr. A. W. Boyd, series of *Cœnonympha typhon* from Delamere, *Erebia epiphron* from Great Gable, *Boarmia repandata* and *Agrotis ashworthii* from North Wales, *Carsia paludata* from South Lancashire.

November 1*st*.—Mr. W. Buckley, the President, in the chair.—Mr. R. Tait, Jr., gave a paper on "An Entomological Trip to Braemar," illustrating his remarks with series of the insects captured. These included very long series of *Gnophos obfuscata* and *Plusia interrogationis* and fine series of *Cœnonympha typhon*, *Zygæna exulans*, *Coremia munitata* (including a partial second brood), *Thamnonoma brunneata*, *Lygris populata* (very varied), and *Parasemia plantaginis* types and var. *hospita*, bred as a second brood.—Mr. W.

Buckley showed a very long and varied series of *Acidalia contiguaria* from North Wales ova, comprising three broods.—Mr. A. E. Salmon remarked that there had been great difficulties in breeding Saturnidæ this year, *e. g.*, a brood of larvæ was divided up and each lot put into a separate room and fed on food from different trees; all died on the same night. He also stated that there had been a second brood of *Nonagria typhæ* this year.

December 6th.—Mr. W. Buckley, President, in the chair.—Mr. A. E. Wright gave a paper on the "Macro-Lepidoptera of the Burnley District" (with the exception of the Noctuæ). His list was the outcome of many years of collecting, and possibly its most remarkable feature was the absence of many common insects. The most noticeable feature of the insects as a whole was the general tendency to melanism. Fine black forms of *Ematurga atomaria* (both male and female), *Gonodontis bidentata*, *Entephria cæsiata*, &c., were shown.—Mr. J. H. Watson showed an example of *Saturnia pyretorum* sub. sp. *pearsoni*, a new subspecies from Hainan.—Mr. B. H. Crabtree exhibited empty pupæ and living larvæ of *Luperina gueneei* from the Lancashire coast.—Mr. G. Bradburn showed, among others, a variety of *Saturnia pavonia* from Lindow Common, Cheshire, and a red form of *Smerinthus populi* from Brooklands, Cheshire. He also had two specimens of *Porthesia similis* taken at Brooklands on October 18th and 20th.—Mr. C. F. Johnson showed a series of *Acidalia contiguaria* (third and fourth broods); a long series of *Oporabia filigrammaria* and series of *Acidalia imitaria* and *Hygrochroa syringaria* (second brood).—Mr. R. Tait, Jr., showed a bred series of *Agrotis agathina* from North Wales.—A. W. Boyd, M.A., *Hon. Sec.*

RECENT LITERATURE.

1. *Annals of Tropical Medicine and Parasitology.* In vol. v. No. 1, April 20th, 1911, Liverpool, the papers of interest to Entomologists are:—(1) Non-ulcerating Oriental Sore: the cultural characteristics of the parasite as compared with a new similar parasite in *Erthesina fullo* (Thunb.), a pentatomid bug, by Capt. R. Markham Carter, I.M.S.; (2) A very short note on *Glossina grossa*, &c., by R. Newstead, M.Sc., A.L.S., &c.

   In vol. v. No. 2, August 1st, 1911, there are also two papers:—(1) The Papataci Flies (*Phlebotomus*) of the Maltese Islands, by R. Newstead, pp. 139–181, a full and well illustrated paper; (2) Some new species of African Mosquitos (*Culicidæ*), by R. Newstead and H. F. Carter.

2. *Memorias do Instituto Oswaldo Cruz.* Rio de Janeiro. The following papers may be of interest to Entomologists. (1) *Erephopsis auricincta*, a Tabanid of the subfamily Pangoninæ (April, 1909); (2) Beitrag zur Kenntniss der Dipteren (April, 1909); Beitrag zur Kenntniss der brasilianischen Simuliumarten (August, 1909); (4) Ueber eine neue Trypanosomiasis des Menschen, in connection with a bug, *Conorhinus megistus* (August, 1909); Cytologische studien ueber "*Adelea hartmanni*," ein neues Coccidinmaus dem Darme von *Dysdercus ruficollis* L.

(1910); (5) Further account of *Conorhinus megistus* (1910); (6) Zweiter Beitrag zur Kenntniss der brasilianischen Simuliumarten (1910); (7) Neue Beitraege zur Kenntniss der Pangoninen und Chrysopinen Brasiliens (1911).

3. *House-Flies, and their Connection with Disease.* Farmers' Bulletin, 459; U. S. Department of Agriculture. Washington. 1911.
4. *A Manual of Philippine Silk Culture.* By Chas. S. Banks. Bureau of Science, Manila. 1911. Pp. 1–53, with 18 fine plates.
5. Leitz' *Catalogue of Prismatic Binoculars*, 9, Oxford Street, London, W. Entomologists may perhaps be interested in examining a catalogue of these fine instruments.

W. J. L.

OBITUARY.

It is with deep regret that we have to announce the death of Mr. Arthur Cottam, who passed away on November 23rd, 1911, at his residence, Furzebank, Bridgwater, in his seventy-fifth year, after an illness of some months' duration.

As an entomologist he was perhaps better known to the past generation, as recently, owing to the weight of increasing years and failing health, he was not able to take such an active interest in the Lepidoptera and Coleoptera as formerly. His collection of Lepidoptera, the second which he had amassed during his lifetime, was sold at Messrs. Stevens's Auction Rooms only ten days before his death.

From his young days he had been an ardent student not only of entomology but of botany, astronomy, and microscopy; and in January, 1875, he, with a few others, founded the Hertfordshire Natural History Society (at first called the Watford Natural History Society), and was its first Treasurer. He did some active work, and contributed several papers to the Transactions.

For many years he was a Fellow of the Royal Astronomical Society, and published some useful star-maps.

Music and art also claimed a good deal of his spare time, outdoor sketching being one of his favourite occupations at all times of the year.

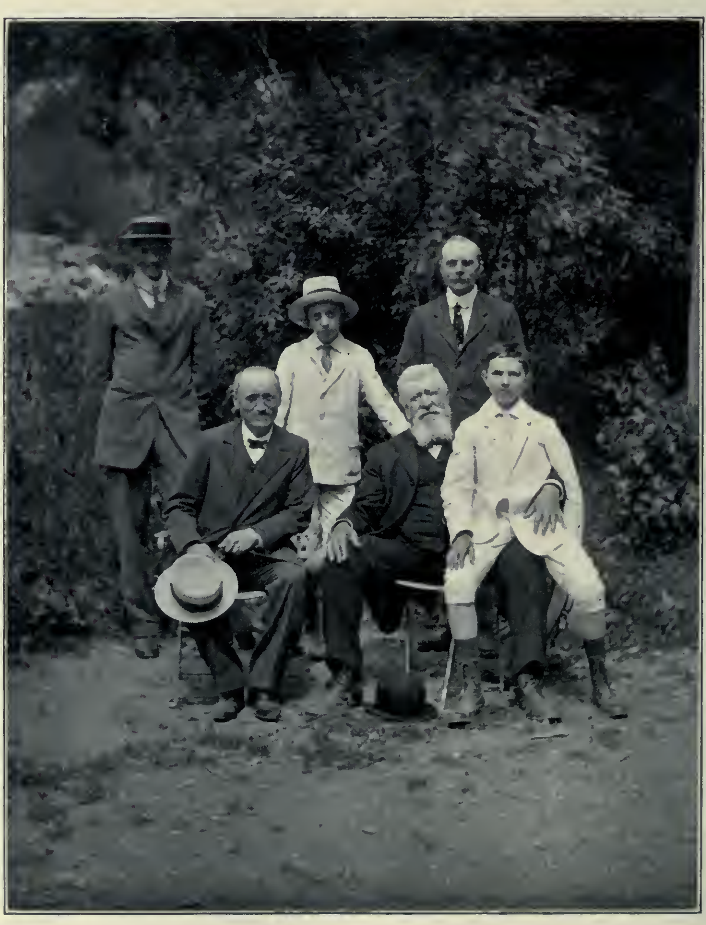
In 1905 Mr. Cottam retired from the Civil Service (Office of Woods and Forests) and went to live at Bridgwater.

His love and all-round knowledge of Nature from many points of view, which he was always ready and anxious to impart to others, made him a most interesting companion, and the writer can recall many delightful excursions made in his company.

He leaves a widow and one daughter to mourn his loss, his only son having died suddenly some nine months ago, after an operation.—P. J. B.

Michael C. Dixon died December 2nd, 1911, at Spennymoor, Durham, aged thirty-seven years. He was attached to the study of Lepidoptera, and specially interested in the preparation of the early stages to illustrate life-histories. His occupation was that of a postman. He was a member of the Carlisle Natural History Society.—G. B. R.

GAVARNIE, JULY, 1911.



West, Newman proc.

H. R.-B.

B. C. S. Warren. Fayol, cadet. H. Rowland-Brown.
P. Rondou. Charles Oberthür. Henri Oberthür.

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A NEW SPECIES OF PHASMIDÆ OF THE GENUS *PRISOPUS*, CONSIDERED ESPECIALLY IN REFERENCE TO THE SUPPOSED AQUATIC HABITS OF THE GENUS.

By C. J. Gahan, M.A.

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Prisopus is a genus of Phasmidæ which, owing to the singularity of its form and structure, cannot very well be described either as a "stick" insect or as a "leaf" insect; but it is one of exceptional interest, inasmuch as it was believed to live under water, and to be eminently adapted by its structure for that mode of life. The species of the genus inhabit tropical America, and those that are known are few in number and apparently rare, very few specimens having yet found their way into public or private collections.

I was glad, therefore, to be able to recognize as a member of this rare and interesting genus an insect which was recently brought to the British Museum and shown to me by Mr. F. G. Fisher, who discovered it at Xapury, a township on the River Acre, in the Amazon Valley. And I was still more pleased when Mr. Fisher very kindly offered to present it for the Museum collection, where we found we had no species quite like it. From investigations which I have since made, the species appears to be new; so I have ventured to name it *Prisopus fisheri* in honour of its discoverer. A more detailed description of this new species is given below. Here I wish more particularly to call attention to certain points about it which serve to throw a light upon the supposed aquatic habits of *Prisopus*; and to say something also in reference to another Phasmid genus, *Cotylosoma*, to which similar habits have been attributed.

When first I saw the specimen brought to me by Mr. Fisher, it struck me at once as being an extremely good and very beautiful example of protective resemblance. And then, though I felt there was no need for the question, I asked him where he found it. The answer was very much as I expected. Mr. Fisher found the insect at rest in the daytime on the trunk of a tree; a small tree or sapling, he could not remember which, nor did he know the name of the tree, but that did not much matter. What chiefly impressed me about the creature was the great resemblance it had to an ordinary piece of bark, and how remarkably well its colours seemed adapted in combination with every other feature to bring about that resemblance. Not that there was anything wonderful in all that; resemblances of a similar kind, many of them quite as perfect, some even more so, are quite familiar to us; and they are especially abundant amongst the Phasmidæ. But we know that the "stick" insects and "leaf" insects do not go and hide themselves under water all day; and I had a vague recollection that that was what *Prisopus* was supposed to do. It was impossible to believe this of the insect before me; for, in such case, its colours and all the remarkable adaptations of structure I noticed could have no use and no signification. So I determined to refresh my memory, and to find out what was known about the habits of the genus.

Turning, first of all, to the 'Cambridge Natural History' where, as I knew, there was a most interesting account given of the Phasmidæ and their habits, I came upon the following statement:—"In Brazil a species of the genus *Prisopus* has the peculiar habit of seeking shelter under the stones submerged in the mountain streams; to enable it to do this it is remarkably constructed, the under side of the body being hollowed, and various parts set with a dense fringe of hairs; the insect is supposed to repel the air from the body in order to adhere to the upper surface of a stone, where it sits with its fore legs extended in front of its head, which is directed against the current."

That was a sufficiently startling statement about a species of Phasmidæ, and I felt certain that Dr. Sharp would not have made it except upon very good authority. Who or what was this authority I had now to find out. So I looked up the genus *Prisopus* in the most recent work on the family, an excellent monograph by Brunner von Wattenwyl and J. Redtenbacher, and very soon found what I wanted. The authors say of *Prisopus* that:—"This remarkable genus lives, according to Murray, in water, where with their hollowed-out ventral side the insects hold on to stones, with the body directed up stream." The same story again, more briefly stated, for which Murray, it appeared, was the authority.

Andrew Murray was a well-known scientific man, and an entomologist of wide experience, who had written much about various groups of insects, including the Phasmidæ, to which he had given a very fair amount of attention. What he had to say on the subject, therefore, was bound to be of considerable interest. It is to be found in his paper "On the Habits of the *Prisopi*," which was published in the 'Annals and Magazine of Natural History,' in the year 1866 (Ser. 3, vol. xviii. pp. 265–268). That paper is certainly well worth reading in full. But its chief point of interest for the moment is that it brings us to the fount and origin of that remarkable little story about *Prisopus* which has been repeated, as we have seen, by other writers.

The real author of the story, however, remains so far anonymous that he is only known to us as a "person," later on dignified by the title of "observer," in whose veracity Mr. Alexander Fry, to whom he first related the story, had the fullest confidence.

The story had reference only to one species of *Prisopus—P. flabelliformis*, but, as Murray very truly remarks :—"All the species are characterized by the same peculiarities of structure, and the habits of one will doubtless be the habits of all.

"According to this observer, then, the insect was obtained by him in the mountains of Brazil; and its habits were to spend the whole of the day under water, in a stream or rivulet, fixed firmly to a stone in the rapid part of the stream, but on the approach of dusk to sally forth into the night air."

Murray believed this story; he was not so much struck by its great improbability, as by the lack of perception on the part of other distinguished entomologists, who had not discovered in the structure of the genus the most admirable and most perfect adaptation for the very purpose explained by the "person." And the rest of his paper is almost wholly taken up with a very detailed description of the insect, in which he proceeds to show how every single detail of its structure fitted in with the story told about its aquatic habits.

The details which he has given of the structure are, with one exception, and apart from the interpretation he placed upon them, very accurate, and may be quoted here *in extenso*, since they apply almost equally as well to the species discovered by Mr. Fisher. The one exception refers to his account of the tegmina or wing-covers. These structures do not reach to the end of the body, nor do they completely cover over the under wings, in any known species of the genus. So that if his description is correct, the species described could not have been *flabelliformis*. But it looks to me as if Murray, in his haste to see "waterproof" structures everywhere, mistook for a continuation of the wing-covers that considerable part of the under wings which projects beyond them, and which is usually coloured so exactly like them in resemblance to bark. It is to be noticed, too, in his description which follows that not a word is said about the coloration of the insect:—

"The whole underside, even the head, is hollowed out like the half of a reed. The surface of that side is flexible, smooth, and highly polished. The margins are thinned off, and the segments of the abdomen, where not fitted to the posterior legs, are provided with flaps or quasi claspers. All the legs fit most beautifully and closely to the side of the abdomen [body rather]. Their outer margin is dentate and provided with a thick fringe of hair, which, like the feathers of a duck, repels water. Moreover, at the knee-joint [this applies only to the front legs] where there is unavoidably an opening or unprotected space, it is provided with a flap, or side knee-pan—a provision which occurs in no other insect with which I am acquainted. This flap hangs down, filling up the opening, and is furnished, like the rest of the outer margins of the leg and body, with a supply of hair impervious to water. The posture of the animal in the water is: fastened to the upper surface of a stone, and with its head turned up stream in opposition to the current. It sits with its forelegs extended forwards in front of the head, and the inner side of the thighs is hollowed out exactly to fit the sides of the head, and the thigh itself is bent down so as to form a continuation of the sides of the long cup or saucer which the underside of the animal represents. The antennæ fold back on the upperside of the head, where there is a depression to receive them. In the other Phasmidæ the tegmina or upper wing-cases are usually short, narrow and coriaceous, and apparently not fitted for much use. Here they are as long as the body, so as to cover the whole of the large underwings when folded up; they are broad enough to do so; and the whole are only of a semi-coriaceous texture, flexible and pergaminous, but most so at the base, thinning away at the termination into a finer texture, approaching that of the lower wings. The claws of the tarsi are strong, powerful, and well adapted for clinging."

Not satisfied with the proofs thus set forth of its aquatic habits, Murray next goes on to endow the insect with powers possessed by no other insect known:—

"In this animal we seem to have a combination of two plans of structure: there are the claws and claspers and flaps for holding on by; there is the hollow underside for adhering, by exhausting the air between it and the stone it clings to, on the principle of the air pump. If, when it settles on the stone and adjusts itself, its tracheæ are full of air, and it then expels the air and by muscular power draws in the skin of the abdomen and underside generally, it must, of course, leave a vacuum, and consequently adhere like a sucker."

We need not dwell upon the extravagance of the suggestions put forward here by Andrew Murray. It is enough for us to know that there is an insect, in all essential respects exactly like the one described by him, which has the habit, not of clinging to stones under water, but of spending the day in clinging by means of its strong claws alone to the bark of a tree. We can see how well this insect is adapted by its colours for concealment in such a situation, and we can see also that the so-called claspers on the abdomen, the knee-pans, the fringes of hair, the dentate margins of the legs, &c., are only so many further adaptations, all of which lend themselves obviously to the same purpose of concealment. The under side of the insect's body is smooth and polished, and of a reddish-brown colour marked a little with black; but that is just the part which, when the insect is at rest, cannot be seen. That it should act like a sucker, seems a physical impossibility; and one needs only to examine the insect awhile to see how absurd is all the talk about the imperviousness to water of its various structures.

As evidence, therefore, of the aquatic habits of *Prisopus*, all the wealth of "corroborative detail" supplied by Murray must be regarded as absolutely valueless, although, no doubt, it did succeed in giving "artistic verisimilitude to a bald and unconvincing narrative," and must have exercised a strong influence on the judgment of subsequent writers, who, without it, we may be well persuaded, would not for a moment have given credit to a story so highly improbable, so utterly opposed to everything known about the habits of the Phasmidæ.

Wood-Mason, well known as an authority on the morphology of insects, was one of those who fully accepted Murray's account of the habits of *Prisopus*; and when his attention was called to another Phasmid, apparently closely related to that genus and distinguished by having a row of five flat oval, fringed structures attached to each side of the metathorax, he at once jumped to the conclusion that these structures were tracheal gills, and he has described them as such, giving to the insect the name of *Cotylosoma dipneusticum*. "This insect," he writes, "is closely related to the *Prisopi*, but is even more profoundly modified for an aquatic life; for it breathes, not only in the ordinary fashion amongst insects by means of tracheæ opening by stigmata to the exterior of the body, but also by the structures known as tracheal gills." His statement seems to have passed unchallenged until, in 1895, both Dr. Sharp and Mr. C. O. Waterhouse called attention to it, and expressed their doubts about the function attributed to the so-called tracheal gills. The question, however, as to the true nature of the structures was left undecided. Having examined them lately, I have come to the conclusion that they cannot possibly be tracheal gills. In the first place, they exhibit no traces whatever of tracheæ, and, secondly, they are dotted all over with dark pigment spots. They are to a certain extent movable, and they are in form and structure, as Waterhouse has pointed out, very like the two flat oval appendages at the base of the front tibiæ in *Prisopus*, the so-called "knee-pans" described by Murray. And it appears to me that their purpose is the same—to effect the better concealment of a part which, without them, would be somewhat too easily seen. For this purpose it is an advantage that they should be movable, since they could be adjusted to slope down from the sides of the body to the surface on which the insect rests, playing the same part for the metathorax as the hind legs do for the abdomen, and the middle legs for the fore part of the body. It will be noticed that in the new species of *Prisopus* there is a well-marked triangular process on each side of the metathorax, corresponding in position with the movable appendages of *Cotylosoma*; and as to the meaning of this process there can be very little doubt.

Apart from the assumption made by Wood-Mason, there is no reason whatever for believing that *Cotylosoma* is aquatic in its habits. On the contrary, we have very good reason for believing that it is not. Before Wood-Mason wrote his paper, some years even before Murray's paper appeared, MacGillivray described as *Prisopus carlottæ* a species which really belongs to the genus *Cotylosoma* and which is very closely indeed allied to *dipneusticum*. Concerning this species he tells us:—"The colour is variable; it is either a dull greyish-green, finely and irregularly mottled, or silvery-grey, also mottled, having greenish and yellowish shades, altogether reminding me of some of the lichens." Very unusual colours for an aquatic insect, but by no means exceptional in an insect which "is said," as MacGillivray further states, "to be found on the trunks of trees."

Prisopus fisheri, n. sp.

Colour: on the exposed parts of the head, thorax, femora, and tibiæ light yellowish brown, with a more or less considerable admixture of ashy white and greenish white; on the elytra, dark green at the base and over the basal prominences, dark brown beneath these on each side, yellowish brown, varied with greenish grey over the rest of the surface, but becoming darker towards the apex, and with two dark brown spots on each elytron a little past the middle; pale grey on the upper surface of the anterior segments of the abdomen, dark brown on the posterior segments; exposed parts of the under wings coloured like the posterior half of the elytra, the folded parts pale green, mottled irregularly with dark brown; body beneath chocolate-brown on the abdomen, pale testaceous on thorax, with blackish hind border to the meso- and meta-sternum.

Head without spines, but with four short rows of small tubercles above extending forwards from the occiput, and with a crenulate carina, beneath which is a dark line, along each side. Pronotum without spines, and bearing only a few very inconspicuous granules. Mesonotum relatively rather short. Metathorax with a conspicuous triangular process on each side, whose edges are somewhat dentate, and with a few lateral cariniform tubercles placed anteriorly. Elytra furnished each with a large, laterally prominent, hump or tubercle near the base.

Length : of body, from front of head to apex of abdomen, 67 mm.; of pronotum, 4¼ mm.; of mesonotum, 5½ mm.; of elytra, 36 mm.

Breadth : of metathorax, measured below the elytral prominences, 13 mm.

Hab. Xapury, on the River Acre, Amazon Valley.

This species appears, on the whole, to be most nearly allied to *P. horstokkii*, de Haan, but is readily to be distinguished from that species and from all others of the genus by the strong triangular process on each side of the metathorax.

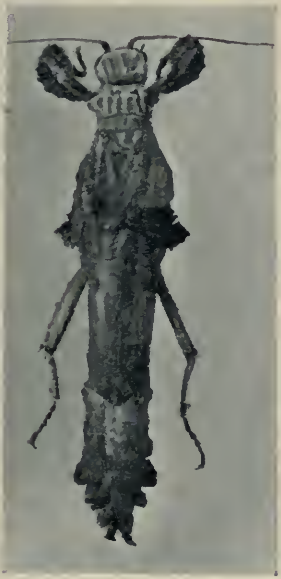
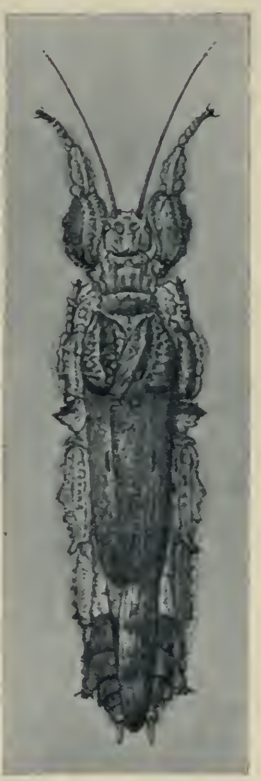


Photo H. Main.



H. Knight del.

One of the figures is from a drawing made by Mr. Horace Knight to show the insect in what we conceive to be its resting position, with the legs placed, slanting outwards, alongside the body; the other, from a photograph for which I am indebted to Mr. Hugh Main, represents the insect just as it was received—the middle legs hidden through being tucked in under the body, and the flexible lobes at the sides of the mesothorax and abdomen bent in more than would be quite natural in the living insect.

THREE WEEKS IN THE HIGH PYRENEES.

By H. Rowland-Brown, M.A., F.E.S.

(Plate II.)

The summer of 1911, entomologically speaking, appears to have been remarkable in the Central Alps by reason of the comparative scarcity of butterfly life. In the Pyrenees things were by no means so bad as reported by our Swiss collectors, though I cannot say that Lepidoptera were anything like as abundant, with one or two notable exceptions, as I found them in the same localities in 1905. The climate of the Hautes-Pyrénées is notoriously uncertain in the higher ranges; settled weather is scarcely ever experienced for any length of time, and last July, though the sun blazed from a cloudless sky throughout the month on the plains, we had none too much of his majesty at Gavarnie. The tiresome cross-journey from Eaux Bonnes *via* Pau, up to the last hour or two when we were well on the road from St. Sauveur to Gèdre, was insupportably hot. But by the time we had come to the upper valley of the Gave de Gavarnie the clouds had gathered round the higher mountain peaks, and it was raining as we pulled up at last before the Hôtel des Voyageurs, to receive a most kindly welcome from M. and Madame Vergez-Bellou. Here we remained from the 13th to the 30th, Mr. A. H. Jones, Mr. G. T. Bethune Baker, and, lastly, Mr. C. J. Wainwright swelling the entomologist population, already represented by M. Charles Oberthür and an energetic party of young hunters; while from Gèdre presently came M. Rondou, full of kind information and suggestions for our explorations. I had, however, already some knowledge of the country, and our first day was devoted to an *Erebia* hunt in the high valley under the Pic d'Astazou to the left of the famous Cirque. The clouds of yesterday had now dissolved, and it was under a radiant blue sky and in bright sunshine that we mounted the steep zigzag which leads up to the iris-covered slopes which six years before had provided the finest collecting-ground for me in the Pyrenees. Nothing apparently was changed. The mule-path was as rough and broken as ever; the humming waters of the cascades on either side made music in our ears, and the great purple iris swept in waves of delicate colour down the mountain side as far as the eye could see. But a change there was, and very much to our disadvantage; for, whereas these preliminary slopes swarmed with butterflies in 1905, with the exception of one or two species nothing was now really abundant; while on the ground where I took so many lovely Anthrocerids, not a single one did I see either on this or on any one of the several subsequent excursions in this direction. Indeed, the Burnets were practically non-existent at

Gavarnie this year, the only one even approaching abundance being *A. exulans*, on the opposite side of the Cirque at about 7000 ft. With these and a lonely example of *A. contaminei* my three weeks' list is practically complete!

Arriving at the top of the zigzag the ground opens out somewhat with steep side slopes, terminating at the lower path level with beech woods and occasional firs. The numerous flocks and herds hereabouts had grazed the pasture thin, but still there were plenty of wild flowers and stubby conifers to attract the butterflies, it being noticeable, in this connection, that *Plebeius argus*, which was flying in hundreds, preferred the shrubs to the plants when at rest. A few days later, on the same ground, the females of this dainty "Blue" had almost entirely superseded the males, and were equally abundant. Of the latter I took one or two, and examined a great many for aberrations, but beyond occasional examples with the orange marginal lunules of the upper side obsolete, I found little worthy of remark. Mr. Lowe (Brit. Butterflies, Tutt, vol. iii. p. 182) notes this form in Guernsey apparently—"entirely fuscous"—but I am not familiar with it elsewhere, and it is curious that Tutt, who was singularly fertile of names, did not (I think) consider it worthy of a special designation. While I am on this subject, I may also mention that the Gavarnie form of *Agriades corydon* is quite characteristic, and M. Oberthür in the first instance drew my attention to an almost constant variation of the *under side* of the male. On the fore wings, which are silvery white, no markings of any sort remain except the discoidal spot and the antemarginal sickle-shaped row, which is composed of abnormally small and sharply defined spots. The hind wings are of the same colour as the fore wings; the marginal spots survive, but the marginal thin line and the orange lunules are almost imperceptible. The bases are powdered silvery blue; the basal, costal, and antemarginal spots *all* without ocellation, and very small. Indeed, were it not for the remaining black spots on the marginal row of the hind wings, the whole facies bears a strong resemblance to the under side of *Polyommatus meleager*, male. *Corydon* was just coming out when we arrived; it was afterwards plentiful locally. The females showed no tendency to blue suffusion, as was also the case with those of *P. argus*, but I took one of the pretty form on which all four "discoidals" are strongly edged with white (= ab. *albicincta*, Tutt). A rather striking peculiarity of the "Blues" this year in the Central Pyrenees was what might be called their emergence by instalments, and it happened both with *corydon*, and more markedly with *P. pyrenaica*, that just when the males appeared to be on the wane there would come (often in the same localities) a fresh supply to take the places of the forwards.

To resume my account of the 14th of July—the lower slopes yielded little beyond some bright fine *E. tyndarus* of the eyed-form, for which it appears we must now revert to the Von Hochenwarth's prior name (1785) of *cassioides* (= *dromus*, H.-S.): the females were few and far between; nor was there any profusion of *E. epiphron* var. *pyrenaica*, H.-S.—that is to say, the *cassiope* form with broad, bright, macular chestnut bands and large spots—though I quite agree with Mr. H. J. Elwes (Trans. Ent. Soc. 1898, p. 174) that these characteristics are themselves inconstant, and that the form hardly deserves a varietal name, even in these days when it is the fashion to overload our catalogues with undistinguished Latinity. Keeping to the left, and ascending what appear to be interminable grass slopes, too closely cropped to sustain much lepidopterous life, at a break in the monotonous verdure there is an outcrop of stone. Hereabouts the hitherto ubiquitous *E. stygne* (Ruhl's var. *pyrenaica*, and about as "inconstans" as the last-mentioned "variety") left us, and our old friend *E. lappona* began to appear—all var. *sthennyo*—and just before attaining the cow-shelter, which is beneath a vast overhanging ledge of rock, I netted an *Erebia* never before taken by me at Gavarnie—*E. manto* var. *cæcilia*, Hb.—actually an "all black" butterfly; and, oddly enough, though I afterwards found it in another locality in the Val d'Ossue away to the west, I captured no second example at this spot, and conclude, therefore (it was in perfect condition), that it must have been a stray. Higher again, where *E. gorgone* swarmed in 1905, and *E. lefebvrei* also, single specimens alone fell to my net. The latter butterfly, at all events, was not out. Round the "bergerie" rocks also flitted a considerable number of *Parnassius mnemosyne* (also new to me at Gavarnie), and though no undamaged examples were taken on this expedition, quite ten days later I picked up a decent male or two among the predominating ragged rascals.

Here also, flying at dizzy speed, were the males of *Hepialus alticola*, Obthr., mentioned by me in my paper on Eaux-Bonnes, and Mr. Warren, when we came back on the 20th, discovered a specimen of the extraordinary apterous female, to which the males were assembling, and this I had the pleasure of handing over to M. Charles Oberthür, whose collectors were on the look-out for *alticola*, but apparently had not struck our excellent locality.

During the whole day we saw few other, even of the commonest, Alpine butterflies, and it was not until the 25th that *E. gorgone* (males) became really plentiful. The 15th was devoted to the Val de Poueyespée, the lateral valley leading to the Porte de Gavarnie, on the Spanish frontier, to the right of the Cirque looking south. This was another of my former pet hunting-grounds, and at almost the identical spot where I had netted my first *P. pyrenaica* six years before I met with this exquisite little butterfly again. At a certain spring above the long series of zigzags, and on flower-covered rocks, the males were much in evidence for a few days—the black females very rare; I only took three in as many weeks. This spring also furnished several male *P. eros*, yet another welcome addition to my Gavarnie experiences, and on the marshy pasture in which the stream loses itself Mr. Warren netted one or two male *Colias phicomone*—this season again unaccountably rare. The damp ooze was a veritable Lycænid and Hesperiid trap; clouds of *P. argus* mingling with *P. hylas*, a few worn *A. thetis*, and a grand form of *Hesperia alveus*. Occasional *H. serratulæ* also haunted the upper pastures, and the most beautiful race of *Pyrgus sao* I ever saw; the hind wings vivid carmine beneath, with the big costal white spots of pearly brilliance, but though we were both keeping a sharp look-out for *H. andromedæ*, we saw nothing of this new-found Pyrenean Skipper.

Ascending gradually, the "road" to Spain traverses a short series of skrees, and up and down the treacherous stone shoots, as long as the sun shines upon them, ascend and descend an endless procession of male *E. lefebvrei*, never in clusters, but singly. The best—in fact, the only—way to make sure of a series is to station oneself on the mule-track, and strike at the butterflies as they cross. But, in my experience, the females never came down or up to the path, and the two or three brought home by me must have been secured in one or other of the desperate rushes I made after some particularly fine male, who probably left me seated and sliding with half the mountain behind me after a last ineffectual sweep of my net! The higher slopes up to and underneath the snow produced nothing this year except worn *E. lappona*, and some fresh *Anthrocera exulans*; the aforesaid skrees my single *A. contaminei*. And here I may offer a correction, based on the unrivalled authority of M. Oberthür and my own far more limited range of observation in the Pyrenees, that, notwithstanding the records of Struve, d'Aubuisson, and Von Caradja, *E. glacialis* does not occur in the Pyrenees at all; strange though it may seem, the last two authors, at all events, having mistaken *E. manto* var. *cæcilia* for the ab. *alecto* of the highest flying of the western *Erebias*. The more closely we consider the mountain-butterfly items of Von Caradja's list for the Department of the Haute-Garonne, the more certain it seems that the author took many of his observations at second-hand. But M. Rondou is engaged on a new edition of his own 'Catalogue Raisonné des Lépids. des Pyrénées,' and in this no doubt such errors will be rectified. Lower down the "Coppers" were this year decidedly rare. Of *Chrysophanus hippothoë* (a beautiful sight upon the purple iris) I took one or two females and a male, practically identical with those I bagged in 1906 in

South Sweden. Of *Loweia alciphron* var. *gordius*, occasional males only came my way.

The Val d'Ossue, which we explored on the morning of the 16th, in the immediate neighbourhood of the village, proved the most repaying of all our hunting-grounds, and on the 19th, when we pushed further up on the Route de Vignemalle, we came upon the headquarters of var. *cæcilia* in a very "Garden of Eden" of iris, flying with *E. euryale*, and, with the exception of that mysterious single *cæcilia* on the 16th, this was the only locality visited where we found these two "Ringlets," neither of which I had encountered in 1905. *Euryale* is so common a butterfly in the Alps that one is apt to neglect it. But the range of variation in this single valley within a quarter of a square mile was simply astonishing. I hardly seemed to take two alike, from males with the rusty bands of the fore wings broad and lavishly spotted (but without white ocellations) to examples in which all trace of the spots have disappeared, leaving only the macular bands (= ab. *euryalöides*, Tengstrom), and others, again, in which the bands are reduced to two fulvous spots centred with black on the fore wings, and two minute fulvous spots at the anal angle of the hind wings (? = ab. *ocellaris*, Stgr.); while I have a vivid recollection of having smashed on the setting-board a male which appeared to have lost all traces of fulvous on the upper side of both wings. I visited this place on several occasions; on the 27th, after Mr. Warren's departure, picking up a few of the much-wanted female *E. gorgone* on the rough ground by the torrent, and some exquisite female *H. virgaureæ*, Mr. Warren having already secured a grandly marked example, which he refers to ab. *lineolata*, Tutt.

By the 23rd, however, *P. pyrenaica*, which was common on the runnel side by the mule-path in the lower Ossue valley, had almost disappeared, for the terrific rain which descended almost without intermission from the afternoon of the 17th to the night of the 18th had wiped out the species. Meanwhile, the "assemblies" in this direction were even better attended than in the Poueyespée valley, and the mule-droppings especially drew immense numbers of "Blues" and Skippers, of which *Carcharodus lavateræ* soon became common, with occasional, and always single, *C. altheæ*, *Thymelicus actæon*, and, among the grass, *Urbicola comma*, of which latter M. Henri Oberthür took a couple of the interesting aberration described ('Lépid. Comparée,' fasc. iv. p. 361) as ab. *faunula*, Obthr., with the white spots on the under side of the hind wings confluent, and forming a single large white spot tinted slightly yellow in the centre. I spent a whole morning on this ground trying to emulate his success, but unsuccessfully. On the 19th, however, *Satyrus alcyone*—the sole Satyrid observed this year at Gavarnie—put in an appearance, and almost simultaneously a fine fresh emergence of *Pyrameis cardui* took place. The other Vanessids were scarcely emerged, every nettle-patch being crowded with larvæ of *Aglais urticæ,* and on the wet 18th we found a roadside birch towards Gèdre on which numbers of the larvæ of *Euvanessa antiopa* were taking a shower-bath, and apparently enjoying themselves vastly. Mr. Warren returned next day, and filled with them a huge tin box commandeered from Madame's kitchen, and I believe the majority of the brood should now be qualifying for "white-bordered" British "Camberwell Beauties" this spring, after hybernation in the comfortable thatches of mid-Buckinghamshire. I do not remember having noted the species in the mountains elsewhere feeding on birch; as a rule it prefers various kinds of willow. From the 25th onward to the 30th, when I left for Bordeaux, the weather was extremely unsettled, and nearly all the butterflies met with were becoming worn, after what was, certainly, in most cases, a remarkably short period of flight. I may add also that the usually common Pierids were quite rare, while I took but a single *Pontia callidice* on the Astazou side of the Cirque, *Parnassius apollo* being only occasional where formerly it was present in large numbers. Earlier in the year a very fine form of *Anthocharis simplonia* haunts the mountains round Gèdre; M. Rondou, when I visited his fine local collection, most generously presented to me a series of males and females. Mr. Warren took a worn example or two at the beginning of our visit.

BUTTERFLIES OBSERVED AT GAVARNIE, JULY 14TH–JULY 30TH.

HESPERIIDÆ.—*Carcharodus lavateræ, C. altheæ; Hesperia carthami, H. alveus, H. serratulæ; Pyrgus sao; Urbicola comma; Thymelicus actæon.*

LYCÆNIDÆ.—*Heodes virgaureæ,* and var. *miegii; Chrysophanus hippothoë; Loweia alciphron* var. *gordius; Rumicia phlæas; Lycæna arion; Cupido minimus; Nomiades semiargus; Agriades corydon; Polyommatus hylas, P. escheri* and var. *rondoui,** Obthr., *P. eros, P. pyrenaica; Aricia medon* (a large form); *Plebeius argus; Strymon spini.*

PAPILIONIDÆ.—*Parnassius apollo, P. mnemosyne.*

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* As this form of *escheri* has been only recently distinguished by M. Oberthür (Bull. Ent. Soc. Fr. 1906, pp. 57, 58, and Lépid. Comparée, fasc. iv. pp. 216, 217), I think it may interest our collectors to transcribe a short description from the latter work:—

Male.—Smaller than the type. On the upper side the blue, looked at in full daylight, shows a light greenish reflection; under side uniform grey ground colour, with the black spots very small, and the triangular white mark along the marginal border of orange-yellow spots on the hind wing almost wholly wanting.

Female.—Characterized by blue dusting of the wing bases on the upper side; the fringes of all four wings entirely white, and not brown with white at the apex as invariable in the type.

PIERIDÆ. — *Pieris rapæ; Pontia callidice* (one female), *P. daplidice; Anthocharis simplonia; Leptidia sinapis; Colias phicomone* (males only), *C. hyale.*

NYMPHALIDÆ.—*Argynnis aglaia; Issoria lathonia; Brenthis euphrosyne, B. pales* (the Gavarnie form is brilliantly coloured, and more definitely marked with black than the typical *pales* of the Alps), *B. dia; Melitæa didyma* (scarce), *M. parthenie, M. dictynna* var. *vernetensis*, Obthr.; *Pyrameis cardui; Euvanessa antiopa* (larvæ); *Aglais urticæ.*

SATYRIDÆ. — *Pararge mæra* var. *adrasta* (very fine tawny females), [*P. hiera*—I think M. Henri Oberthür took some worn examples in the Cirque, where it is known to occur in May and June], *P. megæra; Satyrus alcyone* var. *pyrenæa*, Obthr.; *Epinephele jurtina; Cœnonympha arcania, C. pamphilus; Erebia epiphron* var. *pyrenaica, E. manto* var. *cæcilia, E. stygne, E. gorgone, E. lefebvrei, E. euryale, E. tyndarus* var. *cassioides, E. lappona* var. *sthennyo.*

Fifty-nine species in all.

Harrow Weald: January, 1912.

NOTES ON *LEUCANIA FAVICOLOR*, BARRETT.

By RICHARD SOUTH.

IN the autumn of last year the Rev. A. P. Waller, of Waldringfield, Woodbridge, Suffolk, very kindly sent for examination a number of Leucanid moths, among which was a series of twenty-five specimens that he had reared from ova deposited by a female *favicolor* taken in a marsh in the Woodbridge district. The eggs were laid in early July, 1910, and the moths emerged from pupæ, April to June, 1911. The majority of these specimens were referable to *L. pallens*, about nine to *favicolor*, and the remainder were intermediate in form, but approached more closely to *pallens* than to *favicolor*.

From ova obtained from a "*pallens*-like female," taken June, 1907, in the marsh previously referred to, Mr. Waller, in June, 1908, reared twenty-three specimens of *favicolor* of the typical form, and seven examples of the yellow form of *favicolor*—ab. *lutea*, Tutt. I must admit that I could not distinguish the female parent from *pallens*.

To illustrate the range of variation of *L. pallens* in his district, Mr. Waller included a series of captured specimens. Among these were a few of the red form, including one good example of ab. *ectypa*, Hübn. Another specimen seemed to be much nearer to typical *favicolor* than to *pallens*: indeed, if that specimen alone had been sent for identification, I should have returned it as *favicolor*.

Meditating on the significance of the above facts, a doubt arises as to the exact status of *favicolor*. Is it a species, or a salt-marsh development of *L. pallens*? The evidence afforded by Mr. Waller's material certainly seems to indicate that *favicolor* cannot be a species, except perhaps in the Darwinian sense. In any case, the insect is of very great interest, because, so far as we know, it is a purely British production.

The earliest recorded specimens of *favicolor* (one male, three females) were taken, among other Leucanid moths, by Paymaster-in-Chief G. F. Mathew, "on the coast of Suffolk and Essex," in the summer of 1895. Seven other specimens were secured by Mr. Mathew in 1896 (June 23rd to July 3rd). Six years later he captured five males, and saw a female, which flew off the sugar when he tried to box it. In recording the latter specimens he states that *favicolor* "is easily recognized, as it sits with its wings raised, whereas *pallens* closes them tight, and is much more quiet" (Ent. Mo. Mag. xxxviii. 220). At Harwich, in June, 1903, Mr. Mathew obtained a fine series, which was submitted to the late Mr. C. G. Barrett, who wrote (Ent. Mo. Mag. xl. 61):—"These specimens give me a far more extended idea of this pretty species and its variation than we previously possessed. From the soft, smooth, honey colour of the typical form these show the fore wings tinged with red-drab in a less or greater degree, till a deep red, almost a coppery-red, is reached, with a gloss and smoothness very different from the dull and plain appearance of the allied species, and decidedly so from the more pinkish red appearance of some forms of *L. pallens*, in which also are always closely placed lines all over the fore wings. Moreover, these *L. favicolor* maintain the greater breadth of the fore wings, and the decidedly more robust habit of the body. Still more interesting than these red specimens are two or three in which the fore wings are of a distinctly light yellow,* almost the colour of *L. vitellina*."

If at any time *favicolor* was restricted to the Harwich and Felixstowe districts it would seem to have extended its range since 1903. Mr. Waller, then living at Henley Rectory, Woodbridge, secured a specimen of ab. *rufa*, Tutt, that was attracted by light into his room in September, 1904; and in the following year he captured four specimens, three of which (one *lutea* and two *rufa*) came to sugared flowers of dock in July.

In 1906, Lieutenant Jacobs recorded red and yellow forms from the salt-marshes near Queenborough, Isle of Sheppey. In 1908 *favicolor* was taken at Benfleet, Essex, and a specimen "near ab. *lutea*" in East Sussex. At a meeting of the South London Entomological and Natural History Society, November

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* Ab. *lutea*, Tutt.—R. S.

25th, 1909, Mr. Newman exhibited a Leucanid moth, taken at Cranleigh, Surrey, that had been identified as *favicolor*, as *pallens*, and also as *straminea*. The specimen had been examined by genitalia experts, who reported that the specimen was certainly not *straminea*, but whether it should be referred to *favicolor* or to *pallens* they were unable to say. Mr. Edelsten (Entom. xliii. 34) records a specimen of *favicolor*, labelled "Hackney Marshes, 2. vii. 05," that he detected in a series of *L. pallens*, ex coll. Clark.

In a detailed account of the life-history of *Leucania favicolor* (Ent. Mo. Mag. xli. 77), Mr. Mathew compares the larvæ of *favicolor* with those of *pallens*, but up to the half-grown stage found very little difference between them, except that the former were of a rather "warmer colour, less attenuated, larger, and more plump." In their last skin the larvæ of *favicolor* were "cylindrical, short, and plump, very slightly attenuated towards each extremity, and their general colour was of a warm reddish ochreous, and more resembling the larvæ of *lithargyria* than those of *pallens*, which are always of a more or less cold greyish or putty colour with very slight tints of ochreous. The larvæ of *favicolor*, moreover, are considerably larger than those of *pallens*, which are also much more attenuated, and more slender" (p. 106).

Mr. A. W. Bacot, to whom eggs of *favicolor* were sent by Mr. Mathew, states in the same paper (p. 134) that he carefully compared the larvæ of *favicolor* with those of *pallens*. He could find no trace of difference in structure, nor in markings, only some divergence in the general colour; but here, he remarks, "one was met by the difficulty of discriminating between how much was individual and how much specific variation, as there was considerable variation in this respect in the larvæ of each batch."

With regard to the male sexual organs, important in questions affecting specific rank, the opinion of Mr. F. N. Pierce may be quoted. Referring to the type specimen of *favicolor*, he states: "I can see no difference in the form of the genitalia of this and *pallens*, except that *favicolor* is larger" ('Genitalia of the Noctuidæ,' p. 27).

In the foregoing notes the more important facts connected with *favicolor* are presented in the hope that entomologists in a position to do so will endeavour to ascertain the insect's true status. To arrive at anything definite in this matter it would, of course, be necessary to rear *favicolor* from the egg, and to have knowledge of both parents. The rearing of *favicolor* from ova of *pallens*, or of *pallens* from eggs of *favicolor* is strong presumptive evidence of the male parent having been *favicolor* in the one case and *pallens* in the other; still, it would be more conclusive if the male was known in each case. Mr. Crocker, of Gillingham, Kent, writing to me in reference to *favicolor*, remarks:—"In their habitat it is quite common to take *favicolor* and *pallens* in cop. I have three such pairs taken this year [1911]; also a few insects which I am unable to place either with *favicolor* or *pallens*." Perhaps other entomologists may have also met with such cross-pairings when in search of *favicolor*; if so, it is very desirable that the observation should be recorded.

LEPIDOPTERA OF THE SWEDISH PROVINCES OF JEMTLAND AND LAPLAND.

By W. G. Sheldon, F.E.S.

(Concluded from p. 27.)

Callophrys rubi.—Worn specimens were frequent at Mattmar.

Chrysophanus amphidamas var. *obscura.*—Abundant at Mattmar; some of the examples even at the time of my visit, June 4th, were worn, but there was a good percentage of newly emerged ones; the butterfly was most abundant amongst sallow thickets on the edge of the swamps, flitting about the bushes with a very *Thecla*-like flight, and settling on them from time to time. I found ova not infrequently on the under side of the leaves of *Polygonum viviparum.*

C. phlæas var. *hypophlæas.*—I found a single perfect example of this fine form at rest on a bent of grass, at Narvik, on July 19th.

Plebius argyrognomon var. *ægidion.*—First seen at Abisko on June 29th, after which date it became common on the banks of the tributary of the Abiskojokk, where Mr. Rowland-Brown found it in 1906, and which is in the park, but I did not see it elsewhere.

Polyommatus optilete var. *cyparissus.*—The first example was captured on June 29th: it was not common, but I did not work for it, and only brought a few specimens home.

P. icarus.—One female of the *cærulea* form was taken on July 16th: probably the species was only just emerging at the time of my departure from Abisko.

Aglais urticæ.—Larvæ were very abundant at Åre, a few of which I took to Abisko; they pupated there, and emerged on my way home; the whole are very full-coloured specimens, with the central spots large, and one is distinctly var. (ab.?) *polaris.* As Abisko was until a few years ago absolutely without cultivation, I scarcely expected to see this species there: however, a few days after my arrival I came across two battered imagos, and thereupon made a search for nettles, a few patches of which I succeeded in finding, in the proximity of some ruined buildings; one patch in a sunny corner was covered with several hundreds of larvæ, a number of which I brought home. These produced some fine var. *polaris*, which emerged from August 8th to August 18th.

Brenthis aphirape var. *ossianus.*—This species was common at Mattmar, and less so at Abisko. It is essentially a swamp species, and I did not see a single specimen on other ground; one of my examples from Abisko is without silver on the under side, and in this respect resembles the type; but it has the bright red blotches beneath which characterise var. *ossianus*, and is thus intermediate between that form and the type. First seen at Abisko, on July 12th. Herr Sprӧngerts informs me he found it at Narvik on July 20th.

B. pales var. *lapponica*.—This species was noticed at Abisko on July 3rd, but was not common at the date on which I left; probably it was not then fully out.

B. freija.—A few worn examples were seen flying over the bog at Mattmar, and on my arrival at Abisko the species was fully out there and in good condition, and it remained so almost until the time of my departure. It was not very abundant, but I usually obtained about half a dozen examples on each sunny day. This species is purely a bog insect; the males frequented at Abisko the low-lying swamps, probably attracted there by the warmth and shelter from wind. The females were chiefly found higher up the hill-sides. I confined several females on different plants, with a result that I obtained three ova; these unfortunately vanished one day out of the pill-box I kept them in, I suspect in consequence of the attentions of an inquisitive chambermaid. They were deposited on the stems of *Arctostaphylos uva-ursi*, which I give as a possible food-plant. Almost certainly the food-plant is not *Viola*, the only species of which I saw at Abisko being *Viola biflora* and *V. palustris*; the latter is rare, and although the former is locally plentiful in the birch forest, *B. freija* is not found there, except as a straggler; practically the only plants growing when I saw most of the females were *A. uva-ursi* and several species of *Vaccinium*. I do not think any of the Scandinavian Brenthids are violet-feeders, except possibly *B. thore* var. *borealis*, for that was the only species I saw flying amongst these plants, or in the neighbourhood of ground on which they occur. The ova is of a dark straw colour when newly deposited; it has a glazed surface, that portion held next the light being iridescent; it is funnel-shaped, wider at one end than at the other, and the ends are rounded; the surface is ribbed longitudinally, the ova were attached by the narrow ends to the stem of the plant on which they were deposited. The flight of the imago is very irregular, but not fast; it does not appear to frequent flowers, but one often disturbs it from the ground. It looks very dark on the wing for a Brenthid. The form of this species occurring at Abisko is sometimes described as var. *pallida*, Elwes. This is an error. Certainly some of the examples are rather light, but amongst my series of about fifty specimens there is nothing approaching the types of the *pallida* in the British Museum Collection, which were taken in the Altai Mountains by Mr. Elwes. The only striking variation in my series is that one male has the space between the central black transverse line, and that nearer the base of the front wings, almost filled in with black; this is evidently a recurrent form, for I saw other specimens, and might thus be called ab. *fasciata* n. ab.

B. frigga.—This handsome species frequents the bog at Mattmar, where I found it not uncommonly; in three days of intermittent sun I netted thirteen fine examples, including three females. It has much the same habits as the preceding species, but has a much steadier flight, and looks larger and brighter-coloured on the wing. Tutt says ('British Lepidoptera,' vol. ix. p. 30) that "this species is only recorded as feeding on *Rubus chamæmorus*," a very abundant plant at Mattmar.

B. euphrosyne.—Very abundant at Mattmar—in fact, the most abundant butterfly there—and a few examples were netted at Abisko. At Mattmar it frequented the rising ground at the edge of the swamps. The great majority of the specimens seen were certainly not var. *fingal*, though they were slightly darker than the type, and one or two were so clouded with dusky scales that they approached the variety, but they were not so dark as examples of it I saw in the National Collection at Stockholm and in the British Museum Collection. The Abisko specimens were quite typical. I also captured one female at Narvik on July 19th.

B. thore var. *borealis*—This species, which Mr. Rowland-Brown found abundant at Abisko, was this year quite rare; probably it was not out at the date of my departure. It was first observed—a single specimen—on July 10th. I obtained a pair on July 16th, and I believe my German friends accounted for half a dozen examples on July 12th.

Erebia lappona.—Common at Åre, and equally so at Abisko, where it was certainly the most widely distributed and abundant butterfly. The forms from both localities are similar. On the under side of the hind wings some of the specimens have a strong tendency to lose the transverse lines = ab. *pollux*, though none of them quite do so. On the other hand, one of the females has the space between these lines filled in with dark coloration. The upper sides closely resemble my Swiss specimens, except that in the majority of cases the hind wings are entirely without ocelli, though in one or two instances these are well developed.

E. ligea var. *adyte.*—A few examples were seen up the valley of the Abiskojokk, from July 10th onwards; the ocelli in these examples are very small, and the red bands in which they are placed narrow. A specimen netted at Narvik, on July 19th, has the ocelli very large on both fore and hind wings, and the red bands broad; it is quite the brightest banded example I possess from any locality. Both this and the Abisko specimens are small, expanding only 44 mm.

E. embla.—This species is said by Scandinavian entomologists to be only found commonly every alternate year, occurring freely in the even years, I was therefore not sanguine of meeting with many specimens. In this apprehension events proved that I was right, for I saw at Mattmar two examples only, one of which, a male in fair condition, I captured. *E. embla* is, I believe, in an average season, to be found during the last few days of May.

Œneis jutta.—I was unfortunate in only seeing one example of this species, which rose heavily out of the grass at my feet in the Mattmar Bog on June 5th; it was a female of large size, expanding 62 mm., freshly emerged, but slightly crippled. I searched carefully and widely for further specimens, but without success, and can only suppose that the species was not fully out, though it should have been according to the records of previous observers.

Œ. norna.—I obtained in all thirteen examples of this species; the first, a male, on June 25th, another male on June 29th, and a female on July 3rd. These were obtained on the rough ground fringing the swamps east of the Abiskojokk. On July 7th, at Ortojokk, on the north side of the Torne Träske, I found the species common, and obtained eight examples during a short period of sun. They were flying over some grassy slopes, which had a plentiful outcrop of rock, just above the tree line. On July 12th I obtained two specimens on the west side of the Lapp Porten, on similar ground to that on which I found the species at Ortojokk.

There are several forms amongst this series which can perhaps be best described as follows:—

(*a*) Two males and two females. Bases of all wings dark brown, with tawny hind marginal band, two ocelli on each front wing, one on each hind wing = *norna*, Thnb.

(*b*) One male and one female, with ocelli as type, but with bases of wings in male pale brown with greyish tinge and hind marginal band pale buff; in the female the brown is almost lost, and the buff tint is consequently spread over the whole wing area = ab. *pallida*, n. ab.

(*c*) Two males as type, but with one ocellus on each of front and hind wings = ab. *hilda*, Quens.

(*d*) One female with one ocellus on each wing, and with the coloration of (*b*) = ab. *hilda pallida*, n. ab.

(*e*) One male and one female with the coloration of the type, and with two ocelli on front wings, hind wings being without ocelli = *bipupillata*, n. ab.

(*f*) One male with the coloration of the type, and with one ocellus only on each of the front wings, hind wings being without ocelli = *unipupillata*, n. ab.

(*g*) One male with the coloration of the type, all wings being entirely without ocelli = *obsoleta*, n. ab.

Œ. bore.—Flying with *Œ. norna* on the slopes of the Lapp Porten. I captured one male and one female of an *Œneis* which compare exactly with description of this species by Kane and Lang, and which are identical with specimens of it in the National Collection at the British Museum labelled "Sydvaranger." Bearing in mind that specimens of this and the preceding species occur on the same ground at Abisko—and that *Œ. bore* is superficially simply a grey Arctic form without ocelli of *Œ. norna*, which varies greatly in the number and measurement of ocelli, and has at Abisko grey forms, those from the south having the greatest number of ocelli, which gradually decrease in number as one goes north—I should be inclined to suggest that the two form one species. But I am confronted with the statement by Mr. Elwes in the Entomological Society's 'Transactions,' 1893, that the claspers are quite distinct. The matter must, I think, remain undecided until both species or forms have been bred from ova.

Hesperia centaureæ.—I disturbed one fine example of this species from the bog at Mattmar on June 6th, and obtained half a dozen others at Abisko; these were taken on the grassy drier portions of some swamps on the east side of the Abiskojokk, about two kilometres back from the lake, and on the rising ground (beyond the forest) on the way to the Lapp Porten. The first specimens were taken on June 25th, and the last on June 30th.

H. andromedæ.—A "Skipper" netted on the swamp between Abiskojokk and Björkleiden on June 23rd, and supposed at the time to be *H. centaureæ*, and two others taken with specimens of that species on June 30th, near the Lapp Porten, turn out to be undoubted examples of this species.

Augiades comma var. *catena.*—This species was common on the steep right bank of the Abiskojokk and on the banks of the tributary flowing into it on the west side, which was worked by Mr. Rowland-Brown in 1906. It was first seen on July 2nd. This brook, on the banks of which are found certainly more butterflies than on any other spot near Abiskojokk, is the first one on the left bank above the railway bridge; it can be seen from the hotel, high up in its course as a waterfall.

Amongst the Heterocera not a great number of species were seen at Abisko. There were a good many Geometræ, chiefly *Acidalia fumata, Larentia cæsiata, Coremia minutata,* and *Emmelesia albulata.* Of night-flying Noctuæ I did not see a single specimen; but amongst the day-fliers the beautiful little *Anarta melaleuca* was to be startled off rocks commonly, *A. cordigera* and *A. melanopa* also occurred, and *Plusia hochenwarthi* was not uncommon on the banks of the tributary of the Abiskojokk. On July 12th I found *Zygæna exulans* var. *vanadis*, a fine form, abundant on the high ground approaching the Lapp Porten.

Addendum.—Since writing the above my attention has been drawn to the fact that, in addition to the articles on Scandinavian Lepidoptera enumerated on pp. 357 and 358, vol. xliv., there is one in Ent. Mo. Mag. xxxvii. p. 24, by K. J. Morton, F.E.S., entitled "Trichoptera, Neuroptera, Planipennia, Odonata, and Rhopalocera, collected in Norway in the summer of 1900."

Youlgreave, South Croydon: August 21st, 1911.

NEW SPECIES OF *BOARMIINÆ* FROM FORMOSA.

By A. E. Wileman, F.E.S.

Ectropis brevifasciata, sp. n.

♂. Pale brown finely sprinkled with darker, a large purplish brown patch or short band on each wing. Fore wings with four transverse lines, the first preceded by a purplish brown cloud towards dorsum, and the third indicated by black dots on the veins; the second line purplish brown, indistinct; the fourth line (subterminal) pale, wavy, edged with purplish brown below the costa, above the middle and towards dorsum; lower half of space between third and fourth lines almost entirely filled in with purplish brown. Hind wings with three transverse lines, the first dark brown, indistinct; the second dark brown, dentate except towards costa where it is represented by dots on the veins; third line (subterminal) pale, wavy, indistinct towards costa, edged with dark brown towards dorsum; lower half of space between second and third lines partly filled in with purplish brown. Under sides paler, the purplish brown patches of upper side indicated in fuscous.

Expanse, 40 millim.

Collection number, 1590.

A male specimen from Kanshirei, July, 1908.

Ectropis trilineata, sp. n.

Fore wings pale brown, mottled and suffused with darker; antemedial line black, sinuous; discoidal mark black; medial line black, deeply excurved beyond cell, obtusely angled above dorsum; postmedial line black, slightly angled below costa and elbowed opposite cell; space between medial and postmedial lines pale; subterminal line pale, wavy, indistinct, inwardly edged with blackish on the costa, followed by a blackish cloud about middle; terminal line black, interrupted; fringes ochreous brown, marked with blackish. Hind wings whitish, powdered with brownish; discoidal dot brownish; ante- and postmedial lines brownish, only distinct on the dorsal area; terminal line blackish, interrupted; fringes pale brown. Under side rather paler; basal area of fore wings up to medial line suffused with fuscous; postmedial line of hind wings more distinct.

Expanse 32 millim.

Collection number, 810.

A male specimen from Arizan (7300 ft.), September, 1908.

Near *E. nigrilinearia*, Leech, from Western China.

Alcis plebeia, sp. n.

♂. Fore wings pale greyish, finely powdered with black, basal and medial areas slightly tinged with ochreous; costa paler, striated and spotted with black; antemedial line blackish, originating in first black spot, angled below costa, marked with black on median nervure; medial line black towards costa, uniting the discoidal mark with second costal spot; postmedial line, from third costal spot, blackish, serrate, outwardly edged with clear ground colour, indistinct towards dorsum; subterminal line whitish, crenulate, bent inwards at vein four, inwardly shaded and clouded with blackish; terminal line indicated by black dots between the veins; fringes whitish, marked with dark grey at the ends of the veins. Hind wings agree in colour with fore wings, but the ochreous tinge is fainter and confined to medial area only; three blackish transverse lines, the second more distinct towards dorsum, the third corresponding with the subterminal of fore wings; terminal line black, crenulate; fringes dark grey, paler tipped. Under side whitish, the margins, especially of fore wings, clouded with blackish: all wings with black discoidal dot and blackish postmedial line, the latter dotted with black on the veins.

Expanse, 42 millim.

Collection number, 1589A.

One male from Arizan (7300 ft.), July, 1908, and another (the type) from Rantaizan (7500 ft.), May, 1909. In the Arizan specimen the fore wings are less powdered and clouded with black than the type.

Alcis formosana, sp. n.

Fore wings pale brown, powdered and striated with darker brown; costa striated with dark brown; antemedial and medial lines black at extremities, but indistinct between; postmedial line black, dentate, outwardly edged with ochreous; subterminal line pale, wavy, edged inwardly with black at costa above middle and towards dorsum; two series of black dots beyond, one of which is on the termen; the dorsum is tinged with ochreous, and there are faint streaks of the same colour on or between the veins from postmedial line to termen. Hind wings whitish brown, basal third thickly sprinkled with dark brown, except on costal area; antemedial line blackish, rather broad; medial line blackish, dentate, outwardly edged with ochreous; postmedial line blackish, wavy, outwardly edged with the ground colour; area beyond medial line heavily sprinkled with dark brown; double series of black dots as on fore wings. Under side pale brown suffused with fuscous, costa striated with dark brown; all the wings have a black discal spot, that on the fore wings rather large; postmedial line on fore wings represented by black marks on the veins; a blackish cloud-like subterminal band; medial line on hind wings blackish, dotted with black towards costa.

Expanse, 64 mm.

Collection number, 1537.

A male specimen from Arizan (7300 ft.), August, 1908.

Allied to *A. roboraria*, Schiff.

Alcis obliquisigna, sp. n.

♂. Fore wings whitish, rather silky, powdered and clouded with brown, especially on basal and terminal thirds; antemedial line black, only distinct on costa, median nervure, and towards dorsum, where it joins an oblique black streak; postmedial line black, dentate from costa to vein five, thence undulate to dorsum, where it terminates in a black quadrate spot; subterminal line dusky, indistinct. Hind wings agree in colour with fore wings; three transverse lines, the first and third brown, diffuse; the second black, very narrow towards costa, broadened on dorsum, followed by a brown shade-like band. Under side pale fuscous, silky; blackish discoidal mark and postmedial line on all the wings.

Expanse, 54 millim.

Collection number, 795.

A male specimen from Rantaizan (7500 ft.), May, 1909.

Allied to *A. roboraria*, Schiff.

Alcis nigronotata, sp. n.

♂. Fore wings grey-brown with slight reddish tinge; basal band black, interrupted at vein one; antemedial line blackish, marked with black on costa and median nervure, connected with a quadrate black spot on dorsum; discoidal mark black, linear, black dot above it on the costa; postmedial line blackish, sinuous, marked with black on the veins; subterminal line pale but indistinct, a conspicuous black spot on inner edge at vein five, and some smaller black marks towards costa; black lunules on termen connected by thin black line. Hind wings whitish, terminal third suffused with brownish; discoidal spot black; postmedial line indicated by black dots on the veins; tornal half of dorsum greyish marked with black. Under side whitish, slightly ochreous tinged, except on dorsal area of the fore wings; markings similar to those of upper side on the hind wings; on the fore wings the terminal area is blackish from costa to vein two, enclosing a spot of ground colour between veins three and four, the postmedial line represented by black bars on the veins.

Expanse, 40–44 millim.

Collection number, 792.

One male specimen from Arizan (7300 ft.), September, 1906, and one from Rantaizan (7500 ft.), May, 1909.

The species closely approaches *A. semialba*, Moore.

Alcis (?) *costimacula*, sp. n.

Head, thorax, and abdomen dark purplish brown; abdomen slightly ochreous between segments; anal tuft ochreous. Fore wings dark purplish brown, slightly freckled with ochreous on costal area of basal two-thirds; ante- and postmedial lines indistinct, the latter indicated by a large ochreous spot on the costa, and a smaller one on dorsum; subterminal line ochreous, most distinct on costa and dorsum; discoidal mark black; fringes ochreous, marked with dark purplish towards tornus. Hind wings dark purplish brown; basal third flecked with ochreous; medial third ochreous, flecked and mottled with purplish brown, especially towards the costa; transverse lines indistinct; discoidal mark blackish; fringes flecked with ochreous towards tornus. Under side similar to the upper side, but the abdomen is pale ochreous, ringed with purplish brown.

Expanse, 40 millim.

Collection number, 1591.

A male specimen from Sui sha (2000 ft.), July, 1908.

Apophyga nigrofusa, sp. n.

Fore wings whitish, suffused with blackish on basal two-thirds, sprinkled and mottled with brown and ochreous brown on outer third; subbasal and antemedial lines darker, but not clearly defined; postmedial line black, incurved from costa to vein six, where it is angled, thence oblique to dorsum, above which it is bent inwards; space between postmedial and dark basal area of the ground colour finely flecked with brown; subterminal line black, irregularly waved and edged with white; a blackish cloud on termen below apex, and one on the inner edge of subterminal line about middle. Hind wings whitish, fuscous tinged, sparingly powdered with brownish; discoidal spot and postmedial line blackish, the latter most distinct on the dorsal area; traces of a dusky subterminal line;

fringes ochreous brown, preceded by interrupted black line. Under side paler, markings of upper side faintly shown on fore wings.

Expanse, 56 millim.

Collection number, 806 B.

One example of each sex from Arizan, August, 1908.

The female has the basal area of fore wings almost devoid of scales. On the hind wings the discoidal spot and postmedial line are indistinct, but there is a dusky spot on terminal area between veins four and six.

Arichanna (?) *nigrifasciata*, sp. n.

Fore wings pale ochreous, suffused with olive; veins flecked with white; antemedial line black, interrupted above and below median nervure, outwardly edged with white, and followed by a black band which is broadest on dorsum; postmedial line black edged with white, broad on costa, and represented by dots on veins three to five; subterminal line white, wavy, interrupted, black spots on inner edge at each extremity and between veins four and six; termen clouded with black towards apex and tornus. Hind wings pale ochreous, finely flecked with black, inclining to greyish on basal area; discoidal spot and medial line blackish, the latter dotted with black on the veins, and faintly edged with whitish; subterminal band indicated by a black mark on costa, a large black spot between veins six and four, and a black curved streak from vein three to dorsum near tornus; black dots on termen between the veins. Under side similar but paler.

Expanse, 39 millim.

Collection number, 804.

A female specimen from Arizan (7300 ft.), August, 1908.

Gnophos punctivenaria taiwana, var. nov.

Formosan specimens are rather darker in marking than those from Western China. The space between ante- and postmedial lines is whiter, especially towards the costa; subterminal line whiter and more distinct.

Collection number, 1589.

Two male specimens from Rantaizan (7500 ft.), May, 1909.

RHYACIONIA (RETINIA) PURDEYI, DURRANT, AND *R. LOGÆA*, DURRANT.

BY RICHARD SOUTH.

IN the 'Entomologist's Monthly Magazine' for November, 1911 (vol. xlvii. p. 252), Mr. H. Durrant describes two new species of *Rhyacionia*, Hübn. (*Retinia*, Guen.). The specimens of *R. purdeyi*, eight in number, were submitted for identification by the Hon. N. Charles Rothschild. They were taken at Folkestone in July, 1911, by Mr. W. Purdey, who has very kindly presented four specimens, including the type, to the British Museum. This novelty, we are told, rests among needles of the Scots fir (*Pinus sylvestris*) in the daytime, but about dusk it flies from branch to branch.

The *Rhyacionia* described as *logæa* is the species from Scotland that has long been doing duty for "*Retinia*" *duplana*, Hübn., in our collections, and of these so-called "*duplana*" Mr. Durrant has examined some fifty examples. Curiously, the specimen figured as *duplana* (Barrett, 'British Lepidoptera,' xi. p. 40, pl. 476, fig. 2) has now become the type of *logæa*, Durrant.

In general appearance it is not unlike a small *R. sylvestrana*, but "the ferruginous apex of the wing and the slightly different direction of the fasciæ" distinguish it from that species.

In connection with the change in generic name introduced by Mr. Durrant in his paper, the following extracts and remarks may be permissible:—

On the opening page of vol. iv. of 'Illustrations of British Entomology, Haustellata' (1834), Stephens remarks, in a footnote:—"I propose to give at the end of this volume a synopsis of the indigenous Lepidoptera, agreeably to the arrangement and nomenclature of Hübner in his 'Verzeichniss bekanter Schmetterlinge,' 1816, whose arrangement, however, appears to be less dependent upon structure than upon the variations of marking and colour: his groups are therefore in many instances very artificial: nevertheless as his work has hitherto only been occasionally, and not in all cases correctly, referred to, I conceive an abstract of its contents, so far as relates to the British species, as divided and named, nearly twenty years since, may be useful."

In his treatment of the Tortricidæ, &c., Stephens used most of the 'Verzeichniss' names, in a subgeneric sense, but the result was not always happy, and sometimes misleading, as the following critical remarks by Fernald concerning the genus *Rhyacionia*, Hübn., will illustrate:—

"*Rhyacionia*, Hb., p. 379 [Verz. bek. Schm.], with five species under it (*hastana* Hb. (non L.); *buoliana* Schiff.; *gemmana* Hb.; *turionana* Hb.; and *ministrana* L.). On page 392 in the same work, Hübner established the genus *Eulia*, with *ministrana* L. the only species and type, thus eliminating this species from *Rhyacionia* Hb. The second and third names, *buoliana* and *gemmana*, represent one species, so that there are only three species left from which to select the type. Stephens, in his 'Illustrations,' page 178, adopted *Rhyacionia* for a subdivision of the genus *Orthotænia*, with *turionana* (*buoliana* Schiff.), *gemmana* Hb., and *bentleyana* Don. under it, but on page 180 he adopted *Rhyacionia* Hb. as a genus, with *hastiana* L. the only species under it.

In accordance with Merton Rule No. 48, we should accept this last. This, however, is impossible, as the *hastiana* of Stephens is neither the true Linnæan species of that name nor *hastana* Hb., but is *ulmana* Hb. (see Stephens's List, p. 48).* Hübner supposed his *hastana* was the Linnæan *hastiana*, as shown in his 'Verzeichniss,' p. 379, and also in his 'Systematisch-alphabetisches Verzeichniss,' page 61, 1822. As he spelled his *hastana* different from the way that Linnæus spelled his *hastiana*, the two names have been retained for these two species. We are obliged therefore, as the Stephens type of *Rhyacionia*, on page 180, is a species not given originally under *Rhyacionia*, to reject this and take the restriction on page 178, where *turionana* Steph. (non Hb.) *buoliana* Schiff.; *gemmana* Hb. (a synonym of the same), and *bentleyana* Don. (*schultziana* F.) are the only species given, and as the last was not given by Hübner, *buoliana* Schiff. becomes the type of the genus. Lord Walsingham names this same species as the type in the 'Annals and Magazine of Natural History' (7), vol. v. page 124, 1900" (Fernald, 'The Genera of the Tortricidæ and their Types,' pp. 9–10).

Buoliana, Schiff., has been generally accepted as the type of *Retinia*, Guenée (1845); the latter name, however, will have to be merged in *Rhyacionia*, Hübn. Meyrick ('Handbook of British Lepidoptera,' p. 471) places *buoliana* and its allies in *Evetria*, Hübn., but previous authors, by removing to other genera four of the five species standing under this generic name in the 'Verzeichniss,' left only *tedella*, Clerck, and this species therefore became, automatically, the type of *Evetria*, Hübn. According to Fernald, *Evetria* = *Eucosma*, Hübn., the type of which is *circulana*, Hübn., a North American species congeneric with *tedella*, Clerck. The last-named species, it may be mentioned, is referred by Meyrick to *Epiblema*, Hübn., the type of which was fixed by Stephens as *fœnella*, L., but as this also appears to be congeneric with *circulana*, Hübn., *Epiblema* will be a synonym of *Eucosma*.

Type fixing by elimination, as exemplified in the cases of *Rhyacionia* and *Evetria* referred to above, is a process resorted to when the type of a genus has not been indicated by the original author. As we have seen, this method of ascertaining a type is not so simple as it may look.

Frequent name changing, whether generic or specific, is of course troublesome, not to say perplexing, but it appears to be inevitable. The modern trend of entomological action has been not only to uphold priority but to enforce it, so that in the present day the "law" is almost universally recognized by systematists. Some there are, certainly, who advocate exceptions and restrictions, but if we are ever to have anything approaching finality in nomenclature, strict priority, without any qualification whatever, must prevail. There can be no question that the only method of securing even approximate stability is to ascertain with certainty not only the earliest legitimate names of species, but the true generic position of species in classification. Thanks to the untiring investigations of many able specialists, the time is probably not very far distant when we may be able to feel confident that, in the majority of cases at least, the last word has been written or said on both these important points, and that rock-bottom in such matters has been reached.

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* 'List of the Specimens of British Animals in the Collection of the British Museum.' Part x. Lepidoptera (1852).—R. S.

BY THE WAY.

"Hengistbury Head, as I have known it and cared for it, is at an end. . . . Hengistbury Head and the bit of wild and wet ground between the estuary of the river and the strange bastions and embankments of the great mass on the land side have been sold. . . . It is to be developed and improved. I foresee a row of new bungalows . . . a golf links . . . the Head itself crowned by a great hotel . . . Hengistbury will so soon be harnessed to civilization that the wild life of it is no more a thing to be secretive about. Its Natural History period is over . . . There is no other spot from the Old Harry Rocks to Hayling so alluring to those who value wild life in a wild scene as the great 'ham' immediately under the headland, and the flats and swamps there—the tract that belongs half to the land and half to the water." "I have never been to this place without seeing something worth remembering," says Mr. George Dewar in the 'Morning Post,' on the 6th ult., nor have we; and we shall deplore its loss to us, "when the new age begins there this year or next." All the Christchurch records of the fine maritime earwig, *Labidura riparia*, come from the base of this bluff, where we passed a lovely afternoon last June. Latterly it seems to occur in greater numbers further west.

The social supper given by "The President of the Entomological Society and other entomologists," at the Holborn Restaurant on the 16th, was a brilliant success. The one point to be aimed at was to perpetuate the delightful annual gatherings of entomologists of every class, exactly on the lines adopted for nearly thirty years by Mr. G. H. Verrall; whether this were achieved by a single individual, by a few persons inviting the rest, or by ticket, was entirely immaterial, and the middle course has been adopted for the first year. The accident of Mr. Morice taking the chair forms no precedent for future Presidents of the Society, with which and the Entomological Club the present arrangement has no official connection.

At a representative gathering of subscribers on January 3rd, ways and means were discussed, and it was found that the funds already amounted to sufficient to entertain fully the usual number of guests; and, in fact, a hundred and twenty could be seated. It was admitted that further subscriptions would come in when the movement became more widely known; those present were Rev. F. D. Morice (Chair), Collin, Waterhouse, Champion, Sich, Col. Yerbury, Gibbs, Rowland-Brown, Jones, Prof. Image, Morley, Rev. G. Wheeler, Adkin, Dr. Jordan and Turner. Neither a suggestion for forming a new social society for the perpetuation of the function, nor another for the extension of the Club limits, met with any support. It might be pointed out that special care should in future be taken to invite foreign and colonial entomologists temporarily residing in England. We failed to see either Maxwell Lefroy or N. B. Kinnear among the nearly one hundred who assembled on the 16th to drink standing and in silence to the memory of Mr. G. H. Verrall.

The acting Government Entomologist, Mr. C. French, gave us an interesting account and plate of the "Parasitic Wasp," *Megalyra fasciipennis*, in the December number of the 'Journal of Agriculture of Victoria,' pp. 818–9. He says they prey upon Longicorn Beetles and Buprestids, and the figured cross-section of damaged timber shows how destructive these insects are. *Megalyra* is not a true Ichneumonid, and the genus is now considered as a distinct family, well represented in the British Museum by three or four of the few known kinds from Queensland, Victoria, South Australia, and Tasmania. Mr. W. W. Froggatt has well monographed this small family in the Trans. Linn. Soc. N. S. Wales for 1906.

NOTES AND OBSERVATIONS.

HESPERIA MELOTIS, Dup. (HYPOLEUCOS, Led.).—Being at the moment engaged in an attempt to arrange the Western Palæarctic Hesperiids, I have on many occasions availed myself of the exhaustive accounts of the British species of this difficult group given in the late J. W. Tutt's 'Natural History of British Butterflies.' To the short article announcing Dr. Reverdin's discoveries relative to *H. malvæ* and *H. malvoides*, I added (*antea*, p. 7) that he had come to the conclusion that *H. melotis*, Dup., and *H. hypoleucos*, Led., were one and the same true species—a conclusion which I should have had no doubt whatever about accepting, had not Tutt described them separately (*Op. cit.* vol. i. pp. 229–230) as varieties of *malvæ*. The notice of *melotis* ends: "It occurs in May in the Tyrol and in Switzerland," and the author proceeds: "We are inclined to refer to Duponchel's variety (*sic*) only those dark examples from the eastern

Alps (the most brilliantly marked form of the species found in Central Europe); *some of the finest of these that we have seen came from Locarno* . . . ." Now *melotis*, or *hypoleucos*, occurs in Andalusia, where Rambur found and described it (Cat. Lepid. And. p. 76, 1858), and in the island of Milo, probably other islands of the eastern Archipelago, and in Syria; and I was vainly endeavouring to reconcile with it Tutt's var. (et ab.) *melotis* "from the Tyrol and Switzerland (Duponchel)" when I received an unexpected and surprising solution of the problem from Dr. Reverdin, to whom I am indeed greatly indebted for the information. The translator of the original description faithfully transcribed the notice of *melotis* in Duponchel's "Hist. Nat." Supp. i. p. 257, down to the bottom of that particular page. He then inadvertently turned over the following two pages, with the intervening plate xlii., and copied—"It occurs in May in the Tyrol and Switzerland" from the concluding sentence of an account of *H. alveus*! I can only suppose that Tutt himself never examined Duponchel's figure of the species, or the series of *H. melotis* (*hypoleucos*)—some of the specimens Lederer's own—in the South Kensington collection; perhaps even they were not available when he wrote his article on *malvæ* and its vars. However, Dr. Blachier, of Geneva, sometime since detected this remarkable oversight, and it would now appear necessary, therefore, not only to strike out var. *malvoides*, Elw. and Ed.; var. *alpina*, Tutt; and var. *pyrenaica*, Tutt, as varieties of *malvæ*, but to dissociate *melotis*, Dup., and *hypoleucos*, Led. from any such immediate connection with our one British *Hesperia*. Further, allowing for the wide separation of Duponchel's (and Lederer's) *melotis* in the Greek Archipelago, and Rambur's *hypoleucos* in Southern Spain; a break of continuity paralelled in the case of *Zegris eupheme*, South Russia, and (var. *meridionalis*) Andalusia; and *Hipparchia hippolyte*, Sierra Nevada and the Urals; the slight differences in the descriptions of *melotis* and *hypoleucos* by their respective authors amount to no more than might be expected of regional forms of the same species occurring in such widely distant localities. How Tutt squared his Locarno examples with Duponchel's *melotis* I do not know; at all events Duponchel's types were not derived from North Italy or Switzerland—that is clear.—H. Rowland-Brown; Harrow-Weald, January 15th, 1912.

Metopius dentatus, Fab., and Sphinctus serotinus, Grav. (Bred).—Thanks to Mr. Claude Morley's newly published volume of Ichneumons, I have identified these scarce ones amongst others bred at various times, now in my collection. When collecting at Roman Bridge, North Wales, during August, 1902, I came upon a number of full grown larvæ of *Lasiocampa quercus*. These soon pupated after my return home, and in the following spring five male specimens of *Metopius dentatus* and three *Sphinctus serotinus* emerged from the cocoons? As it seemed odd to rear such different looking ichneumons, I fortunately kept them, not knowing what they were. Since reading Mr. Morley's account of their habits, I begin to doubt my notes and to think it possible some cocoons of *Limacodes testudo* may have been in the same breeding cage, as I find I took some larvæ at Westerham in 1902. As these ichneumons all emerged within a few days, I certainly then thought that they all came from *L. quercus* cocoons, but I may have been mistaken. One specimen of *serotinus* has the base of segments of abdomen black, with apices only yellow. —E. B. NEVINSON; Moorland, Cobham.

[Only seven specimens of *Sphinctus* were known as British, and such records as Mr. Nevinson's go to show how little incentive is necessary to induce our entomological observers to record species hitherto considered of the greatest rarity, with the result that knowledge of the neglected groups is instantly broadened. No doubt can, I think, be entertained that the above examples emerged from *Limacodes*, its only known host; *Sphinctus* is a solitary parasite, and *L. quercus* seems too large a host for its comfort.—C. M.]

SPHINX CONVOLVULI AND ACHERONTIA ATROPOS AT EASTBOURNE IN 1911.—*Sphinx convolvuli* appears to have been fairly common at Eastbourne during September of last year; my own acquaintance with the species consisted in finding a very worn specimen at rest on a fence near the sea on the morning of the 18th, but my friend, Mr. Sharp, informs me that two were found at rest on the beach by the bathing machine proprietor and brought to him; one was taken flying over flowers of tobacco plant, and another from a street lamp near his house. Of six that fell to the lot of another collector, three were taken at rest about the roadways, and one from a sheet hung out on a clothes line to dry; while yet another half dozen are accounted for by Mr. Chartris, most of them taken at rest in various parts of the town; he also took two larvæ, the first found crawling in the roadway, and the other by searching the food-plant in the vicinity, which was found to be much eaten; one of them went to earth but failed to pupate, the other was given by him to a friend, but how it fared is not known. An example of *Acherontia atropos* was found among some boards in the town in October last while they were being removed, and another was reared from a pupa found at Wannock.—R. ADKIN; Lewisham, January, 1912.

SECOND BROOD OF APATURA IRIS, &c.—Last September, when moving a sleeve containing thirteen larvæ of *A. iris* (from the wild), I noticed that one had outgrown the hybernating size. This one continued to feed up slowly. About the middle of October, owing to the cold weather and condition of the foliage, I brought it indoors. On November 4th it pupated, and a rather small female emerged on November 29th. Other species bred as a second brood, all reared under natural conditions, were *Argynnis selene*, *Boarmia consortaria*, *Tephrosia crepuscularia*, ab. *delamerensis*, *Angerona prunaria* (two only out of a large number, both very small females), *Acidalia aversata*, and *A. subsericeata*.—EDWARD GOODWIN; Canon Court, Wateringbury, January 13th, 1912.

COLIAS HYALE IN HANTS, 1911.—Though rather late in the day, it may be of interest to mention that my son caught a female *C. hyale*, on August 14th last in the New Forest, near Lyndhurst. I should be glad to know if many of this species were taken during last summer.—(Captain) W. G. MANLEY; 62, Albert Hall Mansions, S.W., January 10th, 1912.

End of August, near Lyndhurst, New Forest, I took two males and saw a female caught by a boy of *C. hyale* all in good condition.—(Colonel) R. H. Rattray; Tonbridge, Kent.

Argynnis selene in August.—I caught a specimen of *A. selene* on August 17th in fine condition and evidently of the second brood.—(Captain) W. G. Manley.

Xanthorhoë (Melanippe) fluctuata in December. — On December 27th last I took on a fence in Southfields a perfectly fresh specimen of *X. fluctuata*, the weather at the time being abnormally mild.—A. E. Hodge; 14, Astonville Street, Southfields, S.W., January 2nd, 1912.

Phigalia pedaria noted from Reading.—This species was out here on January 7th; my earliest previous dates were January 20th, 1895, and January 21st, 1887.—W. E. Butler; Hayling House, Oxford Road, Reading, January 13th, 1912.

Lepidoptera in the Tonbridge District, 1911.—The past year has been a very good one for moths around Tonbridge, Kent. Sugar was useless till after the middle of July. I caught the following moths around the electric lamps: *Apocheima hispidaria*, *Tæniocampa populeti*, *Notodonta trepida*, *Pygæra curtula*, *Pheosia tremula*, *P. dictæoides*, *Acronycta leporina*, *Mamestra genistæ*, and *Cerura furcula*; specimens of the last-named species were taken on August 1st, 4th, and 6th, and were undoubtedly a second brood. On September 26th a fine specimen of *Acherontia atropos* was taken about 8 p.m. flying round a lamp, and on October 7th two pupæ of the same species were brought in to me by potato diggers; these emerged on October 17th and 22rd. Flying in garden after dusk I caught *Plusia iota*, *P. pulchrina* and five specimens of *P. moneta*, *Geometra papilionaria*, and *Epione apiciaria* (these latter were quite common). A few *Semiothisa notata*, many *S. liturata*, and a few *Boarmia consortaria* and *B. roboraria* were beaten out of trees and bushes. At sugar towards the end of July I took *Apamea ophiogramma* (3), *Caradrina morpheus*, *Triphæna interjecta*, *Plastenis subtusa*, *P. retusa* (2). During September and October also at sugar I took a long series of *Orrhodia vaccinii*, *O. ligula*, and *Eupsilia satellitia*, *Aporophyla lutulenta* (4), *Lithophane semibrunnea* (2). *Amathes lota*, and *Miselia oxyacanthæ* were particularly common throughout the autumn.—(Colonel) R. H. Rattray; 68, Dry Hill Pack Road, Tonbridge, Kent.

A Book Sale.—It is not often that a more interesting collection of entomological books has been brought together than was the case on Tuesday, January 9th, when the libraries formed by Mr. C. H. Schill, the late Mr. B. G. Nevinson, and the late Mr. T. Vernon Wollaston were offered at auction by Mr. J. C. Stevens at his King Street rooms. The highest price realized for any one lot was £37 for a complete set of the 'Transactions' of the Entomological Society of London, from the commencement in 1834 to 1901, 49 vols. in all; while another set commencing with 1836 to 1877 in 20 vols., and some unbound parts, brought £19. A set of the 'Annales de la

Société Entomologique de Belgique,' vols. i–xli, 1857–97, sold for £6; 'Horæ Societatis Entomologicæ Rossicæ,' vols. i–xxvii, 1861–93, £11; and two incomplete sets of the 'Annales de la Société Entomologique de France,' the one of 35 vols. commencing with vol. iv. of the first series and covering the years 1835-6 and 1843–76, £6 15/–, and the other of 46 vols., 1870–1901, 1903 and 1905, £2. A set of 58 vols. and some parts of the (Stettiner) 'Entomologische Zeitung,' 1840–1911, realized £6 6/–; the 'Entomologist,' vols. i.–v., 1840–71 and some unbound parts, £2 15/–; the 'Zoological Record,' vols. i.–xii., 1864–75, £2 10/–, and 'Novitates Zoologicæ,' vols. i.–vi. in parts 1894–9, £2 7/6. There was a good assortment of works on Coleoptera, among them Lacordaire's 'Genera des Coléopterès,' 12 vols. and atlas of plates, 1854–76, 13 vols. in all, brought £3 10/–, and another copy, £5 15/–. Bestimmung's 'Tabellen der Europæischen Coleopteren,' heft 1–64 (heft 12 and 23 missing), 1879–1908, £5; Gemminger et Harold, 'Catalogus Coleopterorum synonymicus et systematicus,' 1868–76, 12 vols., £3 5/–; Gravenhorst's 'Coleoptera Microptera,' 1802, with others, £3 12/6; 'Biologia Centrali-Americana,' Insecta, Coleoptera, vol. ii., part 2, £2 17/6, and another copy, £3; vol. iii., part 1, £2 17/6, and vol. vii., £2 10/–. The only important work on Diptera, Meigen's 'Systematische Beschreibung der Europæischen,' Zweiflügeligen Insekten, 7 vols., 1822–51, was knocked down at £3. Two copies of Westwood's 'Arcana Entomologica,' 1841–5, 2 vols., brought £2 2/– and £2 4/– respectively, and his 'Thesaurus Entomologicus Oxoniensis,' 1874, £3 15/–. Linnæus's 'Systema Naturæ,' ed. xii., 1766–7, 2 vols. in 3, realized £1 17/6; Fabricius's 'Entomologia Systematica,' 4 vols. and Supplement, 1792–8, £1 1/–; Rambur's 'Lépidoptères de l'Andalousie,' 1858, £2; Boisduval's 'Monographie des Zygénides, 1829, with Staudinger's 1871 Catalogue, 8/–; and Gerhard's 'Monographie der Europæischen Lycænidæ,' 1853, £2 2/–. The 'Lepidoptera of Ceylon,' a large folio volume of coloured drawings of butterflies and moths and their larvæ on seventy plates, brought £6 10/–, and among some of our more familiar books may be mentioned Stephens's 'Illustrations of British Entomology,' 1828–46, 11 vols. and Supplement, which sold for £2 4/–; Wood's 'Index Entomologicus,' 1854, £1 12/6; and Kirby's Synonymic 'Catalogue of Diurnal Lepidoptera,' 1871, with Supplement 1877, £1 17/6. The sale was well attended, but we noticed very few of our entomological friends in the room, who, had they been present, might have picked up many a useful volume at the cost of a very few shillings from among the three hundred and fifty-five lots that were offered.—R. A.

SOCIETIES.

Entomological Society of London. — *Wednesday, November 15th*, 1911.—The Rev. F. D. Morice, M.A., President, in the chair.—The Rev. Samuel Proudfoot, 6, Lyme Grove, Altrincham, Cheshire, was elected a Fellow of the Society.—Commander Walker exhibited three specimens of *Phædrophilus o'connori*, Broun, a large and handsome weevil from Mount Quoin, Kaitoke, New Zealand, South Island. The specimens were taken by Mr. G. V. Hudson, F.E.S., of Wellington, New Zealand, at an elevation of 3900 ft., in December, 1910. Commander Walker also exhibited a specimen of the rare Tortrix, *Phalonia* (*Eupœcilia*) *implicitana*, Wocke, taken by Mr. H. G. Champion at Shoreham, Sussex, August, 1911.—Mr. W. C. Crawley, a female and a worker of *Leptothorax tuberum*, Fabr., subspecies *corticalis*, Schenk, new to Britain, found with two larvæ in an empty beech-nut at Pangbourne, Berks, April 24th, 1904. It was named by Forel as a var. with long spines.—Mr. N. S. Sennett, some Coccinellids (*Chilocorus bipustulatus*) as found on Mimosa trees at Mont' Estoril in Portugal, the small exudations of gum presenting what appeared to be a remarkable though hitherto unrecorded case of protective mimicry.—Mr. L. W. Newman, a long series of *Pyrameis cardui*, bred from females captured at Folkestone on September 2nd last. Ova were laid at once and placed in a hothouse kept at about eighty degrees; they hatched on September 7th, and larvæ fed up very rapidly on stinging nettle, the first pupating on September 30th. Imagines started to emerge about a week later, and all were out by October 16th—some five hundred in all. Considerable variation occurred, but the majority of the brood were normal.—Mr. H. W. Andrews, two rare species of Diptera from North Kent, viz., *Syrphus lineola*, Ztt., a male, taken at Bexley on July 8th; and *Sciomyza simplex*, Fln., both sexes, taken in the Thames marshes on June 23rd and July 1st, all in the present year. Mr. J. E. Collin remarked that he had only taken the latter species at Ringwood and in Suffolk.—Mr. E. A. Cockayne, a Geometer taken at Tongue, Sutherland, July 5th, 1906, probably *Cidaria* (*Dysstroma*) *concinnata*, Steph., specimens of which were placed below for comparison.—Mr. J. Platt Barrett, a drawer of *Melanargia galatea* containing: English specimens, altitude under 500 ft., with one aberration. Specimens from the Alps, (1) Brigue, 2000 to 3000 ft., paler than (2) and probably larger; (2) Berisal, over 5000 ft., dark. From the Apennines, (3) Pracchia, near Pistoja, 3000 ft., the smallest form, dark. From Calabria, (4) Gioja Tauro, Plain of Radicena, near sea-level, large and very dark; (5) Palmi, Monte Elia, 1000 ft., very dark; (6) Aspromonte, above Scylla, over 2000 ft., very dark. From Sicily, (7) Mount Etna, over 3000 ft., moderate size, paler; (8) Monte Cicci (near Messina), 2000 ft., large and dark; (9) Monte Scuderi, 1000 ft., very large and rather pale; (10) Messina (Gravitelli), 500 to 800 ft., large and dark (var. *procida*); (11) Megara Hybloea, sea-level nearly, large and pale; (12) Syracuse, sea-level nearly (var. *syracusana*, Zell.).—Mr. A. E. Tonge, a gigantic spider (*Mygale*) from California.—Mr. J. R. le B. Tomlin, a specimen which he said was not strictly an entomological exhibit, but from its curious resemblance to a caterpillar might be of momentary interest to Fellows. It was in reality a species of West Indian oyster (*Ostrea frons*, L.) which attaches itself to twigs. Professor Poulton remarked that both this and the Coccinellid exhibited by Mr. Sennett were probably cases of accidental resemblance.—Professor E. B. Poulton, the following specimens sent to him by Mr. C. F. M. Swynnerton, all of which had been captured on the outskirts (3800 ft.) of Chirinda Forest, Gazaland, South-east Rhodesia:—(1) The female form *hippocoon* of *Papilio dardanus cenea*, Stoll, rescued, September 8th, 1911, by one of his native collectors from a M'lange Bulbul (*Phyllostrophus milanjensis*). The head was wanting, and there were symmetrical injuries at the anal angle of the hind wings similar to those so often seen in living butterflies. (2) Two wings of *Precis archesia*, Cr., ⊙, and the fragments of a Blattid, probably of the genus *Deropeltis*, taken June 25th, 1911, from a spider's web. Professor Poulton also exhibited specimens sent by Mr. J. C. Moulton from Sarawak, showing instances of mimicry, and read Mr. Moulton's account of them. Mr. C. J. Gahan had described one new species of *Daphisia* (*D. elytoides*).—Professor Poulton, six male examples of a remarkable Lycænid, all captured, November 22nd, 1910, in the Uhehe District (3000–3500 ft.) of German East Africa, by Mr. S. A. Neave, F.E.S. The pattern and brilliant colours, which were extraordinary in a Lycænid, strongly suggested on both upper and under surface the appearance, although on a smaller scale, of an *Acræa* of the type of *A. anemosa*.—Mr. Stanley Edwards, a specimen of *Oxynopterus audouini*, a beetle from Borneo, with abnormal antennæ, apparently gynandromorphous, and explained that Mr. Gahan had dissected it and found the genitalia to be entirely female.—Mr. H. C. Dollman, the following species of Coleoptera:—*Philonthus intermedius*, Bois. ab. *donisthorpei*, Dollman, described in the Ent. Rec., December, 1910; *Stenus formicetorum*, Mann., introduced as British in the Ent. Rec., April, 1911; *Bembidium quadripustulatum*, Dj., an example from Ditchling, Sussex, August 17th, 1911; *Hypophlœus linearis*, F. retaken at Oxshott, in July of last year, a species hitherto taken in Great Britain only in Surrey, at Oxshott and Woking; *Mycetoporus forticornis*, Fauv. (one specimen from the New Forest), with *M. clavicornis* Steph., for comparison; *Philonthus corruscus*, G., taken from a dead rabbit at Ditchling; *Stenus morio*, Gr., from Ditchling, taken in October, 1910.—Mr. H. Eltringham, a bred series of *Acræa orestia*, Hew., containing the typical form and also the *A. humilis* of Miss E. M. Sharpe, thus demonstrating the truth of the conclusion at which he had previously arrived as to the specific identity of these two forms. He also showed three male black and yellow Acræas, one of which was the *A. circeis* of Drury, from Sierra Leone. The other two, while differing in appearance from *A. circeis*, were themselves exactly alike, but for the fact that the two tarsal claws of the second and third pairs of feet were equal and similar in one specimen and unequal and dissimilar in the other. A long and interesting discussion followed, on the question of the importance of the tarsal claws as a means of specific distinction, and on the possible correlation of uneven claws in the male, and the abdominal sac in the female.—Mr. Champion called attention to a paper by M. Roger Vérity, in the 'Bulletin de la Société Entomologique de France,' Séance du 11 Octobre, 1911, on new Scottish races of *Erebia æthiops*, Esp. (race *caledonia*), *Satyrus semele* (race *scota*) and *Pararge megæra* (race *caledonia*). The following papers were communicated:—"Descriptions of South

American Micro-Lepidoptera," by E. Meyrick, B.A., F.R.S. "New Species of Hawaiian Hymenoptera, with Notes on some previously described," by R. C. L. Perkins, D.Sc., M.A., F.E.S. "Notes on Hawaiian Hemiptera, with Descriptions of New Species," by R. C. L. Perkins, D.Sc., M.A., F.E.S. "Experiments in the Formation of Colonies by *Lasius fuliginosus*, females," by Horace Donisthorpe, F.Z.S, and W. C. Crawley, F.E.S.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The Annual Meeting was held at the Royal Institution, Colquitt Street, Liverpool, on December 18th, 1911.—Mr. Wm. Webster in the chair. —As Mr. W. J. Lucas, the retiring Vice-President, was unable to be present to read his address "On the Present State of our Knowledge of the Pre-imaginal Stages of the British Dragonflies," this was done by the Secretary.—Mr. Lucas dealt lucidly and in detail with the various methods of oviposition obtaining in the Odonata, drawing particular attention to the habit *Ischnura elegans* possesses of descending beneath the surface of the water for this purpose, and to the two types of dragonfly eggs—the elongate, cylindrical type such as is met with in *Æschna*, and the more or less oval or pear-shaped type found in *Sympetrum* and *Libellula*. The development of the nymphs, their form, habits, and food, the duration of the nymphal existence, and other features of dragonfly binomics were then dealt with in an equally interesting and exhaustive manner; the fact being emphasized that, although of recent years a considerable amount of work had been done, and our knowledge of the life-history of these beautiful creatures had been greatly increased, there yet remained a vast amount to be done in the future. The latter part of the address consisted of a review of the progress of our knowledge of the earlier stages of dragonfly existence, commencing with Thomas Mouffett's 'Insectorum Theatrum,' and bringing the subject down to the present day. The address and the excellent lantern slides with which it was illustrated were greatly appreciated by all who were present.—Mr. C. B. Williams exhibited a box of Lepidoptera collected during the past season in various localities, and including the following:—*Tæniocampa munda*, *Xylina socia*, *X. ornithopus*, *Xylocampa areola*, and *Oporina croceago*, from the Conway Valley; *Argynnis selene*, *Carterocephalus palæmon*, and *Nemeobius lucina*, from Northamptonshire; *Boarmia roboraria*, *Gnophria rubricollis*, *Nemeophila russula*, *Macroglossa fuciformis*, *Lycæna ægon*, and *Argynnis euphrosyne* from the New Forest.—OSCAR WHITTAKER and WM. MANSBRIDGE, *Hon. Secs.*

OBITUARY.—With great regret we have to announce that Mr. SAMUEL JAMES CAPPER, of Huyton, Liverpool, passed away on January 22nd last. A biographical notice will appear in the 'Entomologist' for March.

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THE EARLY STAGES OF *EUSTROMA RETICULATA*.

By Frank Littlewood.

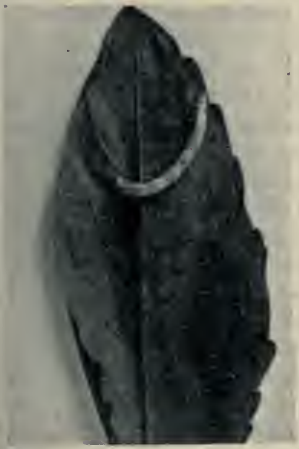


Fig. 1.

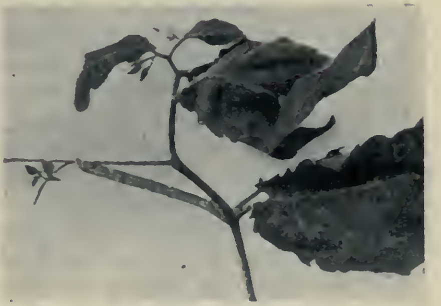


Fig. 2.

Assuming Mr. Prout to be correct in his belief that my observations of the early stages of *Eustroma reticulata* will be of general interest, I have pleasure in placing the same before the readers of the 'Entomologist.'

Seeing, however, that several years have elapsed since these notes were penned, and that I have found neither time nor opportunity for renewing my acquaintance with the species, it is necessary, perhaps, to state that the descriptions of both larvæ and pupæ were written down in my diary *at the time*, for in matters of this kind, where details are essentials, I have found one's memory to be, generally, delusive and unreliable. So that, whilst not pretending to scientific terminology, the following descriptions may be accepted as being, so far as they go, accurate.

Descriptions of Larvæ.—The smallest larva, taken on August 20th, 1905, and apparently only a few days old, was 4 mm., or five thirty-seconds of an inch in length. The majority, however, were somewhat larger, and as they appeared to be only a further development of the same stage, one description will suffice. Length, 8 mm., or ten thirty-seconds of an inch. The natural colour of the body is a peculiarly transparent glossy white, and the texture of the skin reminds one more of a beetle-grub than of a lepidopterous larva. There are no markings on the body. Head and legs also of the same transparent white. On either side of the head is a group of six dark-coloured spots (ocelli), *i. e.*, an upper series of four and a lower series of two spots. Very fine hairs scattered over body and head (visible only under pocket-lens). Owing to the transparency of the skin, however, the actual colour of the body is determined by the food that is passing through the larva. If feeding on the leaves, the anterior segments appear pale green; if on the flower-petals, reddish yellow; if on the seeds, opaque white. The posterior segments are darker in colour, the effect of the digested food, and on looking at the larva against the light at least two separate pieces of frass are clearly discernible close to the anal extremity. A varied diet gives to the larva a somewhat striking appearance, and several, in confinement, where a variety of food was within their reach, exhibited a range of four distinct colours—the first portion of the body opaque white (seed); the next, yellow (petal); the next, green (leaf); the remainder, black (frass). The order of the colours varied according to the taste of the larva, and although this sort of thing would not happen in a state of nature, being simply the result of having the different kinds of food mixed up in the tin in which the larvæ were kept, still it is an interesting illustration of the lack of natural colouring pigment in the skin.

The largest larva, taken on the same day, August 20th, was 13 mm. or seventeen thirty-seconds of an inch in length. (This is the stage succeeding that already described.) Head and legs pale brown. Group of dark spots on head as before. General colour of body pale green. No trace of a medio-dorsal line. A faint white subdorsal line. Spiracles white and joined by a faint, hair-like white line. The incisions of the segments are white. Fine short hairs protrude from small black warts, distributed sparsely but regularly over the body. The spots on the head also each emit a dark hair.

The full-grown larva (described September 7th, 1905) is 25 mm., or one inch in length. Head and legs pale brownish green. The groups of spots on the head now show prominently and are quite visible without the aid of a lens. The body is thickest at the eleventh segment and tapers towards the head, which is narrow and flat. Natural colour of body pale transparent green and the skin not now glossy. There is an interrupted dull red medio-dorsal line, somewhat irregular in outline. This, starting behind the head, continues unbroken to the end of the fourth segment, afterwards being visible only at the segmental divisions, where it appears as an elongated spot. At the anal end two such spots join to form a conspicuous red blotch. The amount of this coloured line varies greatly in different individuals. There is not the slightest trace of red on the sides of the larva. The fairly broad white subdorsal lines join below the anal aperture. Two broad white lines, continuations of the subdorsal lines, extend down the outside of the wide-spread anal claspers. Spiracles dull yellow, connected by a delicate hair-like white line. Body sparsely sprinkled over with minute black warts, each emitting a short black hair. These warts are arranged in circular series around the middle of each segment. Down the middle of the ventral surface is a narrow white line, broken at each segmental incision. In the full-grown larva the white segmental divisions are not so conspicuous. Colour of body still dependent to a great degree on the food, although the anterior portion of the body is now almost always opaque white, due to the full-grown larva's undoubted preference for the seeds.

Habits of the Larvæ.—The young larvæ are found usually resting in various positions on the under sides of the leaves of *Impatiens noli-me-tangere*, and their presence on a plant is denoted by numerous circular holes in the leaves. The majority appear to affect the midrib as a resting-place in the daytime, especially when "lying up" for a change of skin, and in this position are extremely like the narrow unripe seed-pods, which themselves lie along the midrib on the under side of the leaf. Several young larvæ, however, were found stretched at full length along the upper stems and amongst the flower-buds.

In confinement, where a variety of food was provided, the young larvæ fed indiscriminately on leaves, flower-petals, and flower-buds, but seemed to like the latter, which they hollowed out completely. The habit of drilling round holes in the food appears to be the natural instinct of the larva, and points, I think, to the fact of the seed being the proper food. I never observed a leaf eaten at the edge in the usual manner of leaf-eating larvæ.

In the last stage there is no doubt that the unripe seeds form the exclusive food of the larva, and I doubt much whether in confinement they can be brought to normal size if this diet is not provided for them. On several occasions, when my stock of seed-pods got low, I noticed the larvæ wandering about in a restless manner in search of food, and although fresh leaves were introduced, they refused to touch them, and consoled themselves with nibbling the curled-up pods from which the seeds had been expelled. The ripe pods burst at the slightest touch, and the loose seeds lying on the box-bottom were eaten readily. In a state of nature the *full-grown* larva has a very characteristic habit of resting in the daytime with the claspers attached to the midrib of the under side of a leaf, about a quarter of an inch from the base of the leaf, and the body stretched downwards towards the main stem on which the fore legs rest. The main stem, the leaf-stem, and the larva thus form an obtuse-angled triangle, of which the larva is the longest and lowest side.

Occasional specimens are found attacking the pods during the day but the majority rest perfectly quiet till evening, when they wake up and exhibit considerable activity in their search for food. They eat voraciously and increase rapidly in size, the duration of the larval life being about a month. The larva loses its hold readily on being disturbed, and falls curled up with the head tucked in tightly.

At the cessation of feeding, the larva shrunk very considerably, and moved about in an apparently aimless manner, seeking a place for pupation. In confinement the majority spun a tough cocoon of sand and silk, attached to the moss which was laid on the surface of the sand. Several larvæ wrapped themselves tightly in the withered leaves of the balsam. Damp, and plenty of it, seems essential at this period to enable the larva to make a satisfactory change to the pupal state. A number of newly formed cocoons, which I removed to a dry tin on account of the decayed and mouldy state of the balsam, when opened contained crippled pupæ, the larval skin not having been completely shed. All those left in the original tin, amongst the wet food and moss, changed perfectly to fine pupæ.

Full-fed and young larvæ were obtainable together on September 10th, 1905, but as the earliest appearance of larvæ that year would be about August 12th, and the last of my larvæ to spin up did so on September 30th, it appears that there is a period of something like seven weeks during which it is possible to find the larvæ. This period would probably fall later in a cold and backward season (*vide* "Notes on *E. reticulata*," by the Rev. A. M. Moss, in Ent. Mo. Mag., May, 1897).

Description of Pupa. September 16th, 1905. — Average length 9 mm., or rather over eleven thirty-seconds of an inch. Some, probably females, were nearly 10 mm. in length. The pupa is remarkably stout, so that its general appearance is short and stumpy. The surface is smooth and glossy. Anterior portion, enclosing head, thorax, antennæ, legs, and wings, bright transparent green. Abdominal portion light golden brown, the incisions of the segments being darker brown. Green mediodorsal line and, in some pupæ, traces of the red larval spots are visible at the segmental divisions. Between the eleventh and twelfth segments a dull red-brown spot (corresponding to the red larval blotch) is distinct in all the pupæ.

Perfect Insect.—The perfect insect appears to extend over a period of at least four weeks, and, judging from the behaviour of a number of pupæ left in my care that year, 1905 (from larvæ collected by Mr. Moss in 1904) and from observation of the insect itself in its natural haunts, I should say that even where it does occur it will never be very plentiful at any one time. Those I had, emerged in a desultory fashion from July 1st to 30th, one or two each day, and never more than five on one day. Outside, on July 16th, Mr. Geo. Holmes and myself, after four hours' hard work, secured only nine specimens (four fresh, five worn). We missed five, but may possibly have captured some of these again later in the day, so that the insect was certainly not common on that day. But I have not the slightest doubt that, had we visited the localities from day to day, we might have taken fresh *reticulata* up to the first week in August. We were rewarded, however, for sparing the perfect insect in July by the discovery of the larvæ in fair number throughout August and September.

The flight of *E. reticulata* is quick and jerky, not of long duration, for they soon seek shelter among the leaves of the surrounding trees. The extremely rough nature of the ground, remarked upon by Mr. Moss in his former paper, makes their capture something of a feat. The rich colour of the fore wings is most distinct, even when the moth is flying, and notwithstanding the excitement which always accompanies the pursuit of a rare insect, it is impossible to mistake it for anything else.

I regret that I did not find it possible to photograph the larvæ *in situ*. The figures, however, show the general form of the larva and its usual resting postures during the daytime. Fig. 2 had to be coaxed into position for the camera, though, as stated before, the attitude depicted is a common and characteristic one of the *full-grown* larva in a state of nature.

ON THE GENERIC NAME *RHYACIONIA*, Hb.

By Edward Meyrick, B.A., F.R.S., &c.

I should be sorry if Mr. South's commendation of the substitution of this name for *Retinia* should attract others into a deceptive morass. An inspection of the facts as recited by Prof. Fernald will show that the supposed fixation of types by Stephens is accidental only; I (and others) hold that his restrictions are not valid unless intentional. As the true *hastana* is not British, Stephens did not, by merely failing to mention it, exclude it from either of his two uses of the name. Further, by using the same name for a subgenus and genus within three pages, he evidently did not regard the first use as conflicting with the second, and therefore the first use was not intended to be generic, and therefore was not. Again, in the generic use, though he misapplied a specific name, yet his intention was clearly to base the genus on Hübner's species, and not to introduce a different one.

Finally, the name *Rhyacionia* has sixty-two years' established use as based on the type *hastana*, which is after all in accordance with Hübner's specification, and Stephens' intention, as explained above. It might be deemed incredible that anyone would offer to cause so much confusion on such flimsy grounds. Even if the change were made, the discovery of a casual mention of *Rhyacionia hastana* in any publication of earlier date would suffice to reverse the whole procedure.

Thornhanger, Marlborough: Feb. 9th, 1912.

NEW SPECIES OF *BOARMIINÆ* FROM FORMOSA.

By A. E. Wileman, F.E.S.

(Continued from p. 73.)

Alcis (?) *conjuncta*, sp. n.

♂. Fore wings whitish, suffused and clouded with ochreous and speckled with blackish; antemedial line blackish, diffuse; postmedial line blackish, dentate; discoidal spot black, placed on a blackish band from costa which connects the antemedial and postmedial lines on dorsal area; subterminal area blackish, interrupted by the ground colour at apex and at middle, and traversed by a paler wavy line. Hind wings ochreous, merging into whitish on the costal area, speckled with blackish; discoidal spot black, with traces of a transverse line just beyond; some large blackish freckles about middle of terminal area and at tornus. Fringes of all the wings ochreous, marked with blackish. Under side whitish markings faint.

♀. Similar to the male, but on the under side the markings are almost as distinct as on the upper side.

Expanse 28 millim.

Collection number, 1638.

One example of each sex from Arizan (7300 ft.), August, 1908.

Alcis (?) *virgata*, sp. n.

♂. Fore wings white, yellowish suffused and striated with black on outer area, dusted with blackish on basal area; antemedial line blackish, diffuse, indistinct; postmedial line black, only indicated by dots below costa, joined below cell by a black band from middle of costa; terminal area black, patch with yellowish at apex and about middle. Hind wings white striated with black; terminal area yellow tinged, black striæ thicker towards costa, some black dots on dorsum towards tornus. Under side rather paler than above, otherwise similar.

Expanse, 26 millim.

Collection number, 1644.

A male specimen from Kanshirei, July, 1908.

Alcis semiclarata nebulosa.

♀. Fore wings blackish brown clouded with black especially on the median third; antemedial line black, curved; postmedial line black, angled at veins five and two.

Expanse, 36 millim.

Two female specimens from Arizan (7500 ft.), August, 1908.

Alcis semiclarata divisa.

♂. Basal half of fore wings blackish limited by a black, angulated, diffuse line. Hind wings ochreous lightly sprinkled with blackish.

Expanse, 30 millim.

Collection number, 1675.

One male specimen from Arizan (7500 ft.), August, 1908.

Except that they are smaller in size, I cannot find that these specimens from Formosa are specifically separable from Indian *semiclarata*, Moore, and I therefore describe them as forms of that species.

Alcis macularia, sp. n.

♂. Fore wings ochreous, reddish tinged, striated and freckled with black, striæ most distinct on the costa; antemedial line black, diffuse, curved, not very distinct; postmedial line represented by black marks on the costa, veins, and dorsum; subterminal line pale ochreous, wavy, shaded with blackish except on the costal area; discoidal mark black, linear, surrounded with blackish, a black spot above it on costa; fringes ochreous marked with brownish between the veins, preceded by black lunules. Hind wings ochreous faintly striated with blackish; discoidal spot black, small; fringes as on the fore wings but hardly marked with brownish. Under side ochreous faintly striated with blackish; terminal area of fore wings clouded with blackish.

Expanse, 36 millim.

Collection number, 807.

A male specimen from Arizan (7500 ft.), September 13th, 1907.

This species appears to be near *A. megaspilaria*, Swinhoe, from Sikhim.

Alcis basinotata, n. n.

Alcis nigronotata, Wileman, Entom. xlv. 71 (1912).

Ectropis (?) *rusticaria*, sp. n.

♂. Fore wings greyish brown, costal area striated with ochreous and blackish; antemedial line represented by black spots on costa, median nervure, and dorsum; postmedial line blackish, dotted with black, angled at vein six, incurved before dorsum; subterminal line pale, wavy, inwardly edged with blackish; discoidal mark black, black spots above and below it. Hind wings greyish brown; subterminal line pale, inwardly shaded with blackish. Fringes of all the wings pale brown. Under side grey freckled with darker, costa of fore wings ochreous; terminal area of fore wings blackish, enclosing a grey quadrate spot below middle; all the wings with black discoidal spot and black dotted postmedial line.

♀. Rather paler, transverse lines less distinct.

Expanse, ♂ 40 millim., ♀ 42 millim.

Collection number, 808.

One example of each sex from Koannania; the male captured in March, 1908, and the female in April, 1906.

Ectropis pulveraria, sp. n.

♂. Fore wings grey brown, sprinkled with blackish; antemedial line black, curved; postmedial line black, elbowed below cell, incurved before dorsum; subterminal line whitish, irregularly serrated, inwardly clouded with black towards costa and dorsum; discoidal mark black, elongate. Hind wings rather browner; antemedial line blackish, indistinct; postmedial line black, curved and recurved; subterminal line pale, irregularly serrated, inwardly shaded with blackish; discoidal mark blackish, minute. Under side whitish brown, freckled with darker; subterminal area of fore wings blackish, except at apex; subterminal area of hind wings clouded with blackish; all the wings have a blackish discoidal spot.

♀. Similar to the male above; on the under side the outer third of all the wings is blackish, except towards termen of hind wings.

Expanse, 32 millim.

Collection number, 628 *a*.

A male specimen from Kanshirei (7300 ft.), April, 1908; a female from Koannania, May, 1907.

THREE NEW CULICIDÆ FROM THE TRANSVAAL.

By Fred V. Theobald, M.A., F.E.S., &c.

Pseudohowardina lineata, nov. sp.

♂ and ♀. Head deep brown, with a median white line and a thin white line around the eyes; proboscis deep brown, with a line of white scales on the basal half. Thorax deep brown, with three thin pale yellow lines, the median one forked around the bare space before the scutellum, a thin white line on each side; two broken white lines on the pleuræ and spots. Abdomen deep brown, with traces of apical white bands and apical spots. Legs deep brown, unbanded, femora with a white line beneath, and in certain lights the tibiæ pale below. Male palpi acuminate, no hair tufts, brown. Length, ♀ 3·5 to 4·5, ♂ 4 mm.

Habitat.—Onderstepoort, Transvaal.

Time of Capture.—August 8th and 11th, 1910.

Observations.—Described from three females and one male. A very marked species, easily identified by the thoracic ornamentation.

Types in the writer's collection.

Grabhamia caballa, nov. sp.

♀. Head and thorax with rich deep golden scales, a dark patch on each side of the head. Thorax showing traces of linear markings, and with golden chætæ. Palpi and proboscis deep brown: antennæ brown. Abdomen deep brown, with basal creamy bands which spread out to form large lateral spots, and also send out median processes which in some specimens form a dorsal line. Legs brown, mottled with creamy scales, and with prominent basal pale bands; ungues all equal and uniserrate. Wings with brown and creamy scales. Length 4 to 5 mm.

Habitat.—Onderstepoort, Transvaal.

Time of Capture.—November, December, and January.

Observations.—Described from twelve females. It comes near *G. durbanensis*, Theob., but can be told by the hind ungues being uniserrate.

Type in the writer's collection.

Uranotænia nivipous, nov. sp.

♀. Head deep brown, with golden forked scales; palpi and proboscis deep brown. Thorax rich brown, with long dark chætæ; pleuræ pale ochreous; scutellum dusky brown, with dark border bristles. Abdomen black, with apical creamy median areas; venter pale creamy white. Legs deep brown, pale at the base, last two hind tarsi and most of the third creamy white; the last tarsals of the other legs show pale reflections. Wings with normal venation, but in certain lights subcostal, second, and fourth veins show brilliant violet reflections under the microscope. Length 4 mm.

Habitat.—Onderstepoort, Transvaal.

Observations.—Described from a single perfect female sent me by Dr. Theiler. It comes nearest *Uranotænia apicotæniata*, Theob., but can at once be told by the dark scaled head and the absence of pale apical bands on the first, second, and third hind tarsals, and on the second tarsals of the fore and mid legs.

Type in the writer's collection.

Wye Court, Wye: January 3rd, 1912.

NEMOURA DUBITANS (MORTON) AS A BRITISH SPECIES.

BY LIEUT.-COLONEL C. G. NURSE.

ALTHOUGH I devote myself, in my entomological studies, chiefly to Lepidoptera and Hymenoptera, I have been for some years in the habit of taking such specimens of Neuroptera as I may come across casually. Last year I sent a number of specimens of the latter order to Mr. K. J. Morton for determination, and among them he found a single example of *Nemoura dubitans*, which species had not previously been recorded from Britain.

The capture of the above specimen was recorded by Mr. Morton in the 'Entomologist' for 1911 (vol. xliv. p. 134). My knowledge of the Neuroptera is of the slightest, but I determined to make an effort to obtain more specimens of this species, and knowing from the label on the first the exact date and place where it should be looked for, I visited the locality on April 12th, 1911. The place in question, which is about a mile from the village of West Stow, is an ideal collecting ground, and I have taken there several more or less local or rare species of other orders. A marshy spot, covered with reeds and rushes, and studded with trees and bushes of various kinds, it runs down to the river Lark, here only a few yards broad, and the whole place looks as if it had never been cultivated. Walking slowly along the bank of the stream, I soon detected a *Nemoura* struggling along, half swimming and half flying, on the surface of the water. With the help of a long reed I captured and boxed him, and during the course of the morning I obtained a couple of dozen or so, most of them in a similar way. They were probably just emerging.

A few days later I again visited the locality, and on this occasion I found Nemouras in large numbers. A few were flying, but most of the specimens were sitting on branches of alders and the stems of some large beeches, where they were easily detected. I took as many as I required, in fact, had I been so inclined, I could have taken scores. Nearly all, on examination by Mr. Morton, proved to be *N. dubitans*, a few only being *N. inconspicua.*

During the remainder of the summer I took every *Nemoura* that I came across in other localities in the neighbourhood, with a view to ascertaining the distribution of *N. dubitans* in West Suffolk. However, all those taken elsewhere proved to be either *N. inconspicua* or *N. variegata*; it seems, therefore, probable that *dubitans* is very local, though it is almost certain to occur in other places along the river Lark.

I have to thank Mr. Morton for his help in determination, which is not at all easy unless one has made a special study of the smaller Neuroptera.

ON TWO PECULIAR FORMS OF *BOARMIA REPANDATA*.

By William Mansbridge, F.E.S.

Nigro-pallida, var. nov.

For several years prior to 1909 I had captured odd specimens of a peculiar pearly grey form of *B. repandata* of the *nigra* variety. These specimens being all more or less worn were regarded as weather-bleached insects and were not thought of much interest.

In June, 1909, however, I bred about one hundred moths from a captured wild female, and a good proportion—twenty-five per cent.—of these had larger or smaller median areas of pearly grey scales on both fore and hind wings. In extreme examples the grey area occupies the whole of the central part of the wings, and in others only a small part of the alar surface. All the insects are symmetrical, and where the subterminal lines cross the pale blotches they are somewhat lighter in colour and can be clearly seen. The remainder of the wings, except the scapulars, which are dull ochreous, are of a deep velvety black.

The remaining part of the brood were var. *nigra* of an unusually intense black, varying in the development of the subterminal lines, from specimens in which these are brilliant and complete to examples in which they are almost absent, giving, as an extreme, an almost entirely black moth.

Under the microscope the grey areas are seen to be fully scaled, not, as one finds to be the case with the transparent forms of *Odontopera bidentata* var. *nigra*, thinly scaled or with the scales absent. The appearance of the insect is more suggestive of the xanthism found in so-called bleached *Epinephele ianira*, and the varying size and amount of the pale area further point to a case of parallelism.

The peculiarity of these forms is not due to injury, as I have examples showing undoubted injury which has resulted in a clear, white, local patch which is not repeated on the other wings, and, therefore, is not symmetrical.

These xanthic varieties, if I may so call them, are fully up to the average in size and development, in some cases above it, and the true *nigra* forms, when very much dwarfed through the race running out, do not show the peculiarity referred to in a single instance.

Cross pairings were obtained from black specimens of the 1909 brood, with the result that from a larger number of imagines in June, 1910, only a few — some half dozen in all — of the xanthic form were produced.

It may be concluded, therefore, that as this variety is permanent and recurrent and found in a wild state, it is worthy a varietal name, and I propose that of *nigro-pallida* to distinguish it. The types, male and female, are in my collection. This variety must not be confounded with the melanic white blotched form, taken rarely in North Wales and Yorkshire, which has large pale markings in the subterminal region on the fore wings only, as normally occurs in typical specimens, and in which there is a general pale irroration more or less pronounced.

Ochro-nigra, var. nov.

In July, 1910, I made various experimental crossings with the object of discovering the possible parentage of var. *nigro-*

pallida, but without success. As the result, however, of pairing a Knowsley type with var. *nigra* from the same locality, I obtained a form with the terminal and subterminal lines very distinct, of a deep glossy black ground without irroration, but having the usual pale patches on the subterminal line of the fore wings of a clear ochreous colour instead of white; otherwise as in var. *nigra*.

This variety is a very striking and beautiful insect, and I propose to distinguish it by the name—*ochro-nigra*. The original parents were from Knowsley, Lancashire, and the types are in my collection.

4, Norwich Road, Wavertree, Liverpool.

BUTTERFLIES AT DIGNE.

By Gerard H. Gurney, F.E.S.

The following list of butterflies comprises all those species which I took during July and the first few days of August last summer at Digne, with a few notes on the more interesting species. In spite of the abnormally hot summer it was not an early season, neither were insects so plentiful as might have been expected. Certain well-known places and localities which previously I had found teeming with butterfly-life were, for some unaccountable reason, often productive of only the commonest and fewest species; for instance, the well-known gorge beyond the Baths was on many days a great disappointment; however, certain rare and interesting things were taken, and I was specially glad to obtain a nice series of the somewhat elusive *Erebia scipio*. I was struck by the extremely small size of many of the different forms; this may have been due to the want of rain and to the drought. Towards the end of July vegetation generally began to be much burnt up, though constant rain showers in the mountains kept the streams and rivers from becoming dry, and in the orchards and gardens adjoining the Eaux Chaudes the second crops of hay and clover were luxuriant. The heat was excessive all the time, and the thunderstorms and short deluges of rain which came on frequently in the evenings did not last long enough to cool the air. The inhabitants all told me it was an exceptionally hot summer. I was at Digne from July 19th until August 2nd.

Erynnis lavateræ. Somewhat scarce; the few specimens taken were fresh but very small.—*E. alceæ*.—*Hesperia carlinæ* var. *cirsii*. Common.—*H. carthami*.—*Pyrgus sao*.—*Nisoniades tages*.—*Augiades sylvanus*. Very abundant and fine.—*Thymelicus actæon*.—*Adopæa flava*.—*A. lineola*.

Heodes virgaureæ. Males were locally frequent after July 25th;

females scarce.—*Loweia alciphron* var. *gordius*. Much worn.—*L. dorilis*. Males very common and fresh.—*Rumicia phlæas*.

Lycæna arion. Only two or three worn ones noted.—*Cupido osiris* (*sebrus*). I did not note this species; it was common at Digne when I was last there in June, 1907.—*Cyaniris semiargus*.—*Polyommatus damon*. Generally common, especially round Villars, all of them much smaller than specimens from the Rhone Valley.—*P. admetus* var. *rippertii*. Generally distributed; in a few places abundant; quite fresh on July 20th. A long series shows much variation in the size of the spots under side of the hind wings. In several of my specimens the lower line of spots is reduced to the merest dots; in one there are only three very minute specks, in another the two lowest spots are joined together.—*P. meleager*. Males were quite common and very fine; the beautifully coloured females, all of the type, were rather scarce.—*P. hylas*.—*P. escheri*. Not very common.—*P. icarus*. Varying enormously in size, many being mere pygmies; the females generally were very blue.—*Agriades thetis*.—*A. corydon*.—*Aricia medon*.—*Plebeius argus* (*ægon*). I do not think I noted this species. — *P. argyrognomon*. Quite fresh and rather common.—*Everes argiades*. Rare; the few I caught were all of the type; when at Digne in June, 1907, *E. coretas* was common.—*Celastrina argiolus*. Fine fresh specimens of the second brood were frequently noted flying round the tops of willow trees.—*Lampides telicanus*. I caught a perfectly fresh female in a field of lucerne on July 28th; it is rare at Digne.

Zephyrus quercus. Common near the Baths, sitting on the leaves of the cherry trees; very large, fine specimens, and quite fresh.

Strymon spini.—*S. acaciæ*. A few rather worn ones near Villars on July 28th.—*S. ilicis*. Type and var. *cerri*.

Iphiclides podalirius. Very common; larvæ were noted on sloe, almond, and apricot trees.

Papilio alexanor. Frequently seen, but in rags on July 20th; very small larvæ were common, and females were seen depositing ova on the medium-sized plants of *Sesili montanum*, but never on one which was already occupied, no two larvæ ever being seen on two plants anywhere near each other. I have seen it stated that the larvæ of *P. alexanor* cannot be reared on ordinary garden carrot. I found, however, that the few larvæ I brought home fed up freely on this food, and turned into large full-sized pupæ.—*P. machaon*.

Parnassius apollo. Very common and quite fresh, half-way up the Dourbs on July 28th.—*Aporia cratægi*.—*Pieris brassicæ*.—*P. rapæ*.—*P. manni*. I brought home a large number of unset *P. rapæ*, amongst which I shall probably find *P. manni*.—*P. napi*.—*Pontia daplidice*. Not common.—*Leptosia sinapis*.—*L. duponcheli*. The remains of the first brood were still lingering, but no signs of a second brood.—*Colias hyale*.—*C. edusa*.—*Gonepteryx rhamni*.—*G. cleopatra*.

Dryas paphia. Common.—*Argynnis aglaia*.—*A. adippe*. Type and var. *cleodoxa* both equally common.—*Issoria lathonia*.—*Brenthis daphne*. Much worn.—*B. dia*. A few freshly emerged specimens were taken.

(To be continued.)

BY THE WAY.

Bequest to the National Trust.—Mr. George Henry Verrall, of Sussex Lodge, Exning, Newmarket, formerly Conservative M.P. for East Cambridgeshire, one of the leading racing officials, and a partner in the firm of Messrs. Pratt and Co., a former President of the Royal Entomological Society, who died on September 16th, aged sixty-three, left estate of the gross value of £58,268, of which the net personalty has been sworn at £40,778. He left his collection of British Diptera and the cabinets in which it is contained to his nephew, James Edward Collin, conditional upon his offering to the Natural History Museum, South Kensington, three pairs of each species of which he possessed a full series (six pairs constitute a full series), and at least one pair of each species of which he possessed more than one pair; and all his real and personal estate in the parish of Wicken, Cambs., to the National Trust for Places of Historic Interest or Natural Beauty.—'The Times,' February 14th, 1912.

The second meeting of the General Malaria Committee, held in Bombay last November, gives one a capital idea of the vigorous steps being taken by the Indian Government to combat the mosquito scourge. The presidential address of Sir C. P. Lukis, the Director General and Acting Sanitary Commissioner, among a mass of practical information (ably summarized in the 'British Medical Journal' of January 6th last), expresses the hope that, with the aid of the new Indian Research fund, malariometric investigations would now be possible, and the bionomics of *Anopheles* further elucidated. It refers to Dr. Bentley's report on the recent malarial outbreak in Bombay, which confirms earlier observations upon *Neocellia stephensi* as the local culprit. It recounts Major Christopher's discovery that another gnat, *A. ludlowi*, causes havoc in the Andaman Islands, but only within half-a-mile of the coast, no case of malaria at all being found inland, since this species breeds only in salt and brackish swamps. *A. ludlowi* is hardly to be distinguished from *A. rossi*, "yet the existence of two distinct species is the explanation why the proximity of rice lands and swamps is innocuous, provided that these are at a distance from the sea." A bright season is anticipated, owing to the deficient rainfall of the last year; no epidemic of malaria is imminent, and the investigators should now have ample leisure to prepare for a future campaign.

That Mecca of general Nature lovers, the thriving Selborne Society, held its annual Conversazione on February 16th last, in the rooms of the Civil Service Commission, with Lord Montagu of Beaulieu, one of the Vice-Presidents, in the chair. A good many entomologists were present, and the exhibits were keenly appreciated. Microscopists were well provided for, since a number of unusually interesting slides were on view. The display of Old English Folk Dances was a step in the right direction, and the exhibition of the hundred editions to which Gilbert White's 'Natural History' has now run, together with that of the original MS., afforded much pleasure to the very numerous members and guests assembled.

Would that the Rev. T. A. Marshall or Mr. Joe Dunning were yet amongst us to do an essay upon the work recently published by the American Ent. Soc., of which Mr. Meyrick has given us so lucid and masterly an account in a current contemporary! If a Society's scientific status is gauged by the quality of its Transactions, vol. xxxiii. of that quoted will stand as an inerasible blot and detract very seriously from its prestige. We do not know Mr. Kearfott; but he has stirred up more animation in this country than we have seen displayed for a long time. The greatest motive power among us is still discussion upon priority; the word is instinct with electricity in every study and museum. "The earliest name shall stand," cries one. "Let us at least have common sense, of which science is the essence," protests a second. "Eucosma kokana, lolana, nomana, nonana," another quotes, and so *ad nauseam*.

C. M.

NOTES AND OBSERVATIONS.

Labidura riparia.—In "By the Way" (*antea*, p. 76) we are told that all the Christchurch records of *Labidura riparia* come from the base of Hengistbury Head. Whether the records do or not I cannot say, but I think it is doubtful if the earwig itself did. In the two haunts (possibly out of a larger number) near Bournemouth its habits suggest that the soil of the "bluff" is unsuitable for it, and I have never been able to find a specimen there, although it is easy enough to find them in the other two spots. I invariably get them on a certain kind of sandy cliff, of which there seems to be none similar at Hengistbury. It appears to me more likely that "Christchurch" referred to any part of that coast, while it was the chief town in the district, Bournemouth being non-existent, or practically so.—W. J. Lucas.

New British Proctotrypidæ.—It seems advisable to publish the following list of new Proctotrypidæ which I have taken in Britain at various times, and have given to Dr. Kieffer:—*Paragryon algicola*, Kief., n. s., Boll. Lab. Zool. Portici. iv. (1910) p. 343. Males and females taken under seaweed at Fishbourne, Isle of Wight, in company with *Actinopteryx fucicola*, *Actidium coarctatum*, and other Coleoptera.—*Loxotropa pedisequa*, Kief., n. s. "Angleterre (H. Donisthorpe)." André, x. (1911) p. 925.—*Paramesius spinosus*, Kief., v. *atriventris*, Kief., n. v. "Angleterre (H. Donisthorpe)." André, x. (1911) p. 753.—*Spilomicrus hemipterus*, Marsh., v. *pedissequus*, Kief., n. v. "Angleterre (H. Donisthorpe)." André, x. (1911), p. 774.—*Spilomicrus basalyformis*, Marsh., v. *pilosus*, Kief., n. v. "Angleterre (H. Donisthorpe)." André, x. (1911) p. 791. — *Galesus filicornis*, Kief., v. *obscuripes*, Kief., n. v. "Angleterre: Oxford en automne (H. Donisthorpe)." André, x. (1911) p. 857.—HORACE DONISTHORPE.

HERR SPRÖNGERTS has kindly sent me the following list of Heterocera taken by himself (in addition to the species enumerated by me in 'Entomologist,' xlv. p. 69) at Abisko in Swedish Lapland:—"*Agrotis speciosa* var. *arctica*, *A. primulæ* var. *conflua*, *Anarta staudingeri*, *Herminia tentacularia* var. *modestalis*, *Lygris populata*, *Larentia fluctuata* var. *incanata*, *L. incursata*, *L. montanata* var. *lapponica*, *L. ferrugata* var. *spadicearia*, *L. polata*, *L. hastata* var. *subhastata* and var. *mæstata*, *L. affinitata* var. *turbaria*, *L. minorata*, *Gnophos sordaria*, *Psodos coracina*, *Pygmæna fusca*, *Fidonia carbonaria* var. *roscidaria*, and *Phragmatobia fuliginosa* var. *borealis*."—W. G. SHELDON; February 10th, 1912.

ACHERONTIA ATROPOS AND SPHINX CONVOLVULI IN LANCASHIRE, 1911. — I wish to record the occurrence of a specimen each of *A. atropos* and *S. convolvuli* at St. Anne's last autumn. Both specimens were reared, by a young collector, from larvæ found in a garden. — J. M. MUIRHEAD; Norwood, Headroom Gate Road, St. Anne's-on-Sea.

EARLY APPEARANCES OF LEPIDOPTERA. — On January 15th a female *Selenia lunaria* emerged from a pupa which had been kept with others in my dressing-room where there had been no fire. This afternoon (February 15th) one of my colleagues, the Rev. E. A. Hopkins, took a specimen of *Tephrosia bistortata*.—(Rev.) J. E. TARBAT; Fareham.

PHRYXUS LIVORNICA IN DEVON.—I had the good fortune to have brought to me a living male specimen of *Phryxus* (*Deilephila*) *livornica* on January 19th; it was caught on a shrub in a garden. As I can find no record of the capture of this rare insect at this time of the year, I thought it would be well to record it.—G. J. ENOCK; Tavistock, February 15th, 1912.

PHIGALIA PEDARIA IN DECEMBER.—I see in the 'Entomologist' (*antea*, p. 80) that *P. pedaria* was out in the Reading district on January 7th. I thought it would be interesting to record that I took a perfect specimen on an arc lamp outside Messrs. John Barnes's premises in the Finchley Road, N.W., on December 30th, 1911, about 7 p.m.—L. E. DUNSTER; 44, St. John's Wood Terrace, N.W., February 20th, 1912.

NOTE ON VANESSA IO.—On February 7th a friend brought me three live females of *Vanessa io* taken in his house at Greenhithe. Altogether nearly a dozen have been taken by him in the house during the last four weeks. On further inquiry, he tells me that they were all captured in a room facing north, occurring on any fine day, some even during the few extreme cold days, and as he has two old sheds in the garden, possibly they may have been hybernating there. I might further mention as to their remarkable vitality that on transferring the three he gave me from one box to another one of the specimens escaped so quickly that I was unable to recapture it. It struck me that one does not often hear of *V. io* so plentifully in January. — STANLEY A. BLENKARN; Norham, Cromwell Road, Beckenham, February 11th, 1912.

GLOUCESTERSHIRE LEPIDOPTERA. — I am now able to add the following to our local list:—*Plusia moneta*, taken at flowers of honeysuckle on July 9th, 1909, near this city, and at light in Gloucester on July 12th, 1909, by the Rev. G. M. Smith, who also found the larvæ here on *Delphinium* in the following season, on June 1st, 1910; *Lobesia permixtana* (*reliquana*), taken in the Forest of Dean on June 15th, 1911; *Hemimene* (*Dichrorampha*) *tanaceti* (*herbosana*), taken on our hills flying low amongst mixed herbage between 4 and 6 p.m. on August 31st, 1911; *Lithocolletis sorbi*, bred on July 7th, 1911, from mined leaves of *Pyrus aucuparia* collected in the forest on June 29th preceding; and *Nepticula fulgens*, taken on the wing amongst beech on our hills at 2 p.m. on May 11th, 1911.—Mr. Meyrick kindly identified the Micros for me.—C. GRANVILLE CLUTTERBUCK; Heathside, Heathville Road, Gloucester, February 4th, 1912.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, December 6th*, 1911.—The Rev. F. D. Morice, M.A., President, in the chair.—The following gentlemen were elected Fellows of the Society:—Dr. Beckwith Whitehouse, 52, Newhall Street, Birmingham; Messrs. F. W. Edwards, Kingswear, Cornwall Road, Harrow; Douglas Pearson, Chilwell House, Chilwell, Notts; B. H. Smith, B.A., Edgehill, Warlingham, Surrey; C. F. M. Swynnerton, Mount Chirinda, Melsetter, South Rhodesia.—Mr. C. J. Gahan exhibited an insect recently brought to the British Museum, and recognized by him as belonging to *Prisopus*, a remarkable and specially interesting genus of Phasmidæ. The species of *Prisopus* inhabit Tropical America, and appear to be very rare. The one now exhibited was new, and he proposed to name it *Prisopus fisheri*, in honour of its discoverer.—Mr. South, a drawer of *Leucania pallens* and *L. favicolor*, captured and reared by the Rev. W. P. Waller in the Woodbridge district of Suffolk. He observed that, seeing that Mr. Waller had reared *favicolor* from eggs laid by a *pallens*-like female, and obtained *pallens* from the ova of a female *favicolor*, the obvious inference was that there was cross-pairing in each case. Mr. South added that he understood that *favicolor* cannot be separated from *pallens* by any difference in the genitalia, and was informed that cross-pairings of *pallens* and *favicolor* are not uncommon in the habitat of the latter. He was, therefore, inclined to suppose that *favicolor* is a salt-marsh development of *pallens*.—Mr. Donisthorpe, a specimen of *Eryx fairmairei*, Reiche, a species of Coleoptera new to Britain, taken by him in Sherwood Forest, on July 11th, 1908. He also showed a French specimen of the same species, and examples of *Eryx atra*, F., the other known British species, for comparison.—Mr. W. G. Sheldon, a collection of Rhopalocera made by him in Jemtland and Swedish Lapland, in June and July, 1911.—Mr. Henry J. Turner, a large number of specimens of *Luperina nickerlii*, of which the British form or race has been hitherto known as *Luperina gueneei*, together with series of other races from the Continent. Mr. Turner also exhibited a long series of *Erebia æthiops* from many Continental localities and also from Aviemore, Scotland. He made the exhibit at the suggestion of Dr. Chapman, with reference to an article in the Bull. Soc. Ent. France, No. 51, 1911, by M. Roger Verity, in which the Scotch (Galashiels) race of this species was named var. *caledonia*.—Prof. Poulton, a series of specimens tending to refute the view, again recently advanced, that changes of colour and pattern in allied forms are due to climate, and especially to moisture. Also a set of the mimetic Pseudacræas and their models, collected by Mr. C. A. Wiggins, in the neighbourhood of Entebbe, which contrasted remarkably with a set of seventeen Pseudacræas collected by Dr. G. D. H. Carpenter on Damba Island, on the equator, in the Victoria Nyanza, about twenty miles south-east of Entebbe. Also four males and one female of *Planema alcinoe*, captured August 10th, 1911, in the forest, one mile east of Omi, near Lagos, by Mr. W. A. Lamborn, "in a confused mass." Prof. Poulton also exhibited the cocoon of *Norasuma kolga*, together with the moth which had emerged from it. The compact cocoon itself was reddish, with an outer imperfect covering of yellow silk. In some cocoons, including the one exhibited, the silk of this loose and open network formed dense little masses here and there which, being bright yellow in colour, much resembled the cocoons of Braconid parasites. He said that he had been shown by Mr. J. H. Durrant similar spherical bodies scattered over the cocoon of the Tineid moth, *Marmara salictella*. He also exhibited five specimens of *Amauris psyttalea*, Plötz, being all that Mr. W. A. Lamborn "obtained from twenty-five pupæ, the rest being parasitized by Tachinidæ." Seventeen dead pupæ from the same company, twelve of the Tachinid flies, and a number of their puparia were also exhibited. He also exhibited specimens and gave an account of observations sent by Mr. Lamborn, which threw further light on the letter written January, 1891, by the Rev. A. C. Good, Ph.D., from West Africa, from which Dr. W. J. Holland had inferred that the larvæ of *S. lemolea* are aphidivorous; extracts from Mr. Lamborn's letters, together with an investigation of his material, indicate that their food consists of Coccidæ.—Mr. W. J. Kaye, a drawer full of Syntomidæ that had been collected by himself in South Brazil, in the early part of 1910. The following papers were read:—"On the *Nictitans* Group of the Genus *Hydræcia*, Gn.," by the Rev. C. R. N. Burrows. "On the Dates of the Publications of the Entomological Society," by the Rev. G. Wheeler, M.A., F.Z.S.—George Wheeler, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society.—*December* 14*th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—*Special Meeting.*—It was agreed unanimously at an unusually large meeting to increase the annual subscription to ten shillings and the life subscription to six guineas.—*Ordinary Meeting.*—Mr. R. G. Todd, of Barnet, Mr. G. E. H. Peskett, of Ilford, Mr. Mr. A. Quarrington, of Norwood, and Mr. E. A. Stowell, B.A., of Kingston, were elected members.—There was a special exhibition of *Rumicia phlæas* and its allies. Mr. Tonge, series from the south-east counties, and bred Continental specimens; Mr. Newman, on behalf of Mr. Quarrington, ab. *schmidtii* and striated forms; the Rev. G. Wheeler, series from England, S. France, and S. Switzerland, including suffused examples, ab. *cæruleopunctata*, ab. *bipunctata*, ab. *unipunctata*, &c.; Mr. R. Adkin, representative series from Eastbourne this year, and analysed the variation occurring there; Mr. A. E. Gibbs, series from England, North-east France, East Pyrenees, Corsica, Algeria, Turkistan, and Japan, together with many closely allied species from the Palæarctic and Nearctic regions; Mr. Turner, series including ab. *alba* from Brasted; Mr. R. South, a selection illustrating the ordinary variation, including ab. *schmidtii*, and pointed out how the variation of the American representative *hypophlæas* had almost parallel variation; Mr. Cowham, ab. *schmidtii* from Oxshott; Mr. Frohawk, a long bred series of *C. dispar* var. *rutilus* from Continental ova; Mr. C. P. Pickett, long and varied series of four broods in 1911, and many aberrations taken during the past ten years; Mr. Edwards, closely allied Central and East Asian forms; Mr. Kaye, bred specimens. In the subsequent remarks it was noted that the species had appeared in great abundance even in gardens and streets, that there were extremely few striking aberrations, that the later broods were generally darker, that the larvæ hybernated in any instar, and that the species was by no means common in Switzerland.—Mr. West (Greenwich) exhibited a drawer of the Society's cabinet in which he had arranged the British Hymenoptera recently presented to the Society.—Mr. Ashdown, a collection of Lepidoptera taken by him in Switzerland and near Chamonix in June and July last. — Mr. Newman, a number of well-marked aberrations from the collection of Mr. Hills, of Folkestone.—Mr. Quarrington, a fine blue female of *Polyommatus icarus*. — Mr. Buckstone, a series of variations of *Ematurga atomaria*.—Mr. South, a long series of three generations of *Acidalia virgularia* reared in 1911, from a female taken at Bishop Auckland in 1910.—Mr. Joy, two autumn bred specimens of *Apatura iris*, the rest of the brood going over as larvæ as usual.—Mr. Blenkarn, light and dark examples of *Lithosia deplana*, and a specimen of the cockroach *Periplaneta australasiæ* taken from a case of oranges from Jamaica.—Mr. Edwards, the remarkably sexually dimorphic species *Euripus halitherses*, of which the female mimics a *Euplœa*.—Mr. Pickett, a very richly marked aberration of *Hipparchia semele*.

January 11*th*, 1912.—Mr. A. Sich, F.S.E., Vice-President, in the chair.—Mr. C. G. Gahan, M.A., F.E.S., of the British Museum (Natural History), and Mr. N. S. Sennett, F.E.S, of South Kensington, were elected members.—Mr. A. W. Buckstone exhibited series of *Hybernia defoliaria* from several localities, and stated that variation had considerably increased in the last thirty years, and that around London the type form was much less frequent.—Mr. H. Moore, a huge tree-cricket, *Eumegalodon blanchardi*, from Borneo, whose tegmina resemble leaves.—Mr. R. Adkin gave additional notes on the "Lepidoptera of a London Garden," exhibiting *Plusia moneta*, *Monopis rusticella*, *Gracilaria syringella*, *Argyresthia gœdartella*, and *Gelechia malvella*.—Mr. A. E. Gibbs, an aberration of *Pyrameis atalanta* bred from Vizzavona, Corsica, in which the diagonal red bands of the fore wings, and the marginal band of the hind wings are more or less pink, and some areas very much paler than usual.—Mr. Blenkarn, five specimens of *Anthrocera trifolii* var. *confluens* from Withycombe and Horsley, and various species of Coleoptera, including *Bledius secerdendus*, recently announced as new to Britain by Dr. Joy.—Mr. H. Main, larvæ of the glow-worm reared from eggs, and also a larva of *Ocypus olens*.—The Reports of the Society's Field Meetings during the past year were communicated by Messrs. Edwards, Gibbs, Kaye, Priske, Tonge, and Turner.—Hy. J. Turner, *Hon. Report. Sec.*

The City of London Entomological Society.—*December 19th*, 1911.—Rev. C. R. N. Burrows exhibited *Manduca atropos*, female taken at Mucking, Essex, June 9th, 1911, with some of the unlaid ova of which he had abstracted two hundred and eighteen—only one ovum was laid and this was reared.—Mr. H. B. Williams exhibited *Euchloë cardamines*, a male specimen, from Abridge, Essex, with the black apical blotch continued as a narrow line along the outer margin. —Messrs. V. E. Shaw, J. Douglas, and B. S. Williams exhibited their series of *Anchocelis pistacina* arranged to show its great variation; the vars. were *serina*, *obsoleta*, *ferrea*, *lineola*, *rubetra*, *brunnea*, *unicolor-brunnea*, *venosa*, *pallida*, *canaria*, and *sphærulatina*, the latter being much commoner than the type and *canaria* the rarest; the specimens shown being from Finchley, Bexley, Epping Forest, New Forest, and Hunstanton.—Mr. B. S. Williams, *Agrotis nigricans*, var. *marshallana* from Wicken, July, 1911.—Mr. H. M. Edelsten, pupæ and cocoons of *Tapinostola hellmanni* and *T. concolor*, and photographs of anal appendages of females of these species to illustrate the notes read thereon.

January 2nd, 1912. — Messrs. James Douglas and F. H. Southgate were elected members of the Society.—The evening was devoted to the exhibition and discussion of *Rumicia phlœas*. —Mr. A. J. Willsdon, specimens from Deal, September, 1911, including two ab. *obsoleta*, and ab. *cæruleopunctata*.—Mr. W. E. King, ab. *alba*, ab. *schmidtii*, ab. *obliterata*, ab. *infra-extensa*, and an aberration combining abs. *obsoleta*, *cæruleopunctata*, and *magnipunctata*, all from Chingford district where he had noticed a partial fifth brood last season and found some numbers of the larvæ in October. Mr. H. B. Williams, some one hundred and seventy-one specimens from Missenden and district, including abs. *alba*, *eleus*, *addenda*, *caudata*, *suffusa*, *cæruleopunctata*, *parvipuncta*, *magnipuncta*, *basilipuncta*, *major*, *radiata*, *infra-extensa*. He stated that in comparing results of the record 1911 season with other years, he was struck with the numbers of tailed and suffused forms which he attributed to the heat—of one hundred and twenty-three specimens taken in 1911, twenty-four had pronounced tails, and most of those captured in August showed a trace of tails, the September specimens being less remarkable. As to suffusion, only one specimen slightly suffused from September captures, and twenty-three among the August, of which twenty are ab. *initia*.—Mr. A. W. Mera, twenty-four specimens taken at Three Bridges, Sussex, early in August, all of a somewhat dull colour approaching ab. *initia*.—Mr. V. E. Shaw, ab. *obsoleta*, from Darenth, ab. *radiata*, Finchley, ab. *eleus*, *suffusa*, and *cæruleopunctata*, from Bexley. —Mr. C. Nicholson, three larvæ reared from ova of an ab. *cæruleopunctata*, and mentioned how easily females were induced to oviposit, in confinement, by placing them in a large glass cylinder over growing food-plant, covering top with mosquito netting. The showy stonecrop *Sedum spectabile* he had found very attractive to *R. phlæas*, he noticing on one occasion nine specimens on one plant in his garden at Hale End.

January 16*th*, 1912.—Mr. A. L. Mera was elected a member of the Society.—Annual "Pocket-box" exhibition.—Mr. L. B. Prout, specimens of a dark race of *Eubolia bipunctaria* from north Devon, taken on a dark soil and approaching the Continental var. *gachtaria*, Frr., also a female from Sandown, Isle of Wight, with the bands edging the central area strongly darkened. Mr. G. H. Heath, a specimen of *Anosia erippus*, var. *archippus*, found dead in the grass at Sandown, Isle of Wight, on the night of September 13th, 1908; *Xylomiges conspicillaris* var. *melaleuca*, bred from a pupa dug in Worcestershire, September, 1897; *Acidalia incanaria* var. *bischoffaria*, taken at Brockley, September, 23rd, 1911, the first recorded specimen of this melanic form taken in this country.—Mr. Charles H. Williams, *A. grossulariata*, abs., including *varleyata*, *nigrosparsata*, and *lacticolor*.—Mr. V. E. Shaw drew attention to the fact that this latter aberration should be known as ab. *deleta*, it having been named so by Mr. Cockerell in 1889 (see 'Entomologist,' vol. xxii., p. 99). This is the first ab. figured in Edward Newman's 'British Moths,' p. 99.—Mr. A. J. Willsdon, a fine series of *Tapinostola bondii* collected at Folkestone in the grass and in fine condition, equal to bred specimens; *Melitæa aurinia* from Ireland—two specimens of a brick-red ground colour, the usual straw-coloured area being absent on the upper sides, and on under sides the usual pale spots also absent.—Dr. J. S. Sequeira, living stick insects, also *Vanessa antiopa* taken in 1803, from Donovan's collection.—Mr. James Douglas, *Nola cucullatella*, bred from Chingford, some showing a tendency to melanism.—Mr. T. H. L. Grosvenor, *Pieris napi* from first brood, showing following variation: (1) Male with female marking; (2) gynandromorph; (3) male with entire absence of black markings; (4) neural markings at base forming a green margin to secondaries; (5) female with failure of black pigment, and a female specimen from second brood with black discal spot in secondaries. *P. rapæ*, a male absolutely white, female of yellow coloration, female with black spots connected with black markings, and two females with black spots only just discernible; *Argynnis euphrosyne*, a black banded female, a female under side with pearl spots much enlarged, a male with pearl spots greatly reduced.—Mr. A. W. Mera, *Spilosoma lubricipeda* ab. *radiata* and intermediate forms from Yorkshire, specimens of type and var. *radiata* from larvæ collected on Lincolnshire coast, and specimens from London district taken over a number of years, some but lightly marked, others approaching var. *fasciata*.—Mr. F. H. Stallman, *Dicranura bifida* taken at light, Beulah Hill, S.E., July 4th, 1911; *Colias hyale*, female, Margate, August 10th, 1911; *Cyaniris argiolus*, a male specimen having a row of well-marked spots on the under side margins of all four wings, from Holmwood; *S. convolvuli* found at rest near North Foreland lighthouse, August 23rd, 1911.—Mr. W. Crocker, a variable series of *Leucania favicolor* from North Kent marshes, also a pair of dwarf *L. favicolor* he had reared from ova in October, 1909, the remaining larvæ dying after hybernation; *Anthrocera filipendulæ*, specimens with a dark vein intersecting the upper median and sixth spots, and fairly broad borders to hind wings, also two yellow aberrations, and a specimen having an under wing on left side in place of usual upper wing, the right side being normal, bred July, 1910.—Mr. V. E. Shaw, pupæ of *Eupithecia extensaria* from larvæ found on Norfolk coast; a series of *Emmelesia albulata*, and its var. *thules* bred from Unst pupæ, 1911, more than half the pupæ going over another winter.—V. E. Shaw, *Hon. Rep. Secretary*.

RECENT LITERATURE.

The Annals of Scottish Natural History. 1911. Edinburgh.

Not many articles in connection with entomology are to be found in the volume just completed; perhaps when the 'Annals' appear in 1912 under a new form this may be remedied. There are two papers of considerable importance:— "Scottish Dragonflies; some further Records and Table of Distribution," by W. Evans; and "The Aquatic Coleoptera of the North Ebudes," by F. Balfour-Browne, M.A. Shorter papers are:—"On some New and Rare Scottish Diptera," by A. E. J. Carter; and the Scottish species of *Oxyura* (Proctotrypidæ), pt. vi., by P. Cameron. Short notes on "*Labia minor* (Orthoptera) in Haddingtonshire," by W. Evans; *Acherontia atropos* (Lepidoptera) in Caithness," by W. Evans; and "Northern Records of Diptera," by Col. J. W. Yerbury, complete the list.

W. J. L.

Social Life in the Insect World. By J. H. Fabre. Translated by Bernard Miall. With Fourteen Illustrations. Fisher Unwin. London, 1912. Price 10*s*. 6*d*. net.

The lover of insect life who has not yet read any of the delightful essays written, under the title of "Souvenirs Entomologiques," by J. H. Fabre, would be well advised to begin reading them at once. Darwin used no words of flattery when, in writing to the author soon after the publication of his first volume, he said: "Never have the wonderful habits of insects been more vividly described, and it is almost as good to read about them as to see them." Nothing could be truer. Fabre was not only a great and accurate observer, but possessed to an exceptional degree the gift of enabling others to see the things that he himself had seen. Many of his essays are now to be had in English translations. The volume under notice contains fifteen of them, all of absorbing interest, and rendered in a style that has lost little of the lucidity and charm which characterize the originals. Instead, however, of the ants, bees or wasps, which the title of the volume suggests, the insects treated of are mostly creatures of quite different habits and character—cicadas and crickets, the grey locust, the golden *Carabus* and beetles of other kinds, the praying mantis, the great peacock or emperor moth, and the oak-egger, with a few more insects whose habits of life are not usually described as social.

If the names just mentioned are not all to be found within the pages of the book, it is the translator's fault, not ours. His work on the whole would have deserved nothing but praise, had he not shown too great a want of care where the names of insects are concerned, turning as he does, on every possible occasion, a *Carabus* into a *Scarabæus*, a locust into a cricket, or a moth into a butterfly. Transformations of that striking character are merely disconcerting to the reader, and do not in the least add to the attractiveness of the volume.

C. J. G.

Ichneumonologia Britannica. The Ichneumons of Great Britain; a Descriptive Account of the Families, Genera, and Species indigenous to the British Isles, together with Notes as to Classification, Localities, Habitats, Hosts, &c. Tryphoninæ, iv. By Claude Morley, F.Z.S., F.E.S. Pp. i.–xvi. 1–341. H. & W. Brown, 20, Fulham Road, London, S.W. 1911.

To the student of Ichneumonidæ these volumes should be a boon. The present one is not only of the same high standard as those preceding it, but its general usefulness is, perhaps, even greater because of the excellent illustrations in the text. These figures, reproduced from enlarged engravings by Mr. Rupert Stenton, represent one species of almost every genus treated in the volume.

In 1901 the number of British species of Ichneumons referred to the subfamily Tryphoninæ appears to have been something over four hundred. Under our author's revision the total now barely exceeds three hundred and thirty. These are treated under five tribal headings as follows:—

	Genera.	Species.
Tribe Metopiides	1	5
,, Sphinctides	1	1
,, Exochides	10	75
,, Bassides	6	48
,, Tryphonides	32	205
	50	334

So far as known, the Metopiides prey upon larvæ of moths, chiefly species of the so-called "Bombycidæ." *Sphinctus serotinus*, apparently the only Palæarctic member of the tribe Sphinctides, is parasitic on *Limacodes testudo*. Species belonging to Exochides also attack lepidopterous larvæ, largely those of the Tortricina and Tineina. The Bassides, owing to their penchant for larvæ of Syrphidæ which draw their sustenance from Aphidæ, may be regarded as injurious insects. The Tryphonides destroy sawflies, and for this reason, considered from an economic point of view, are useful members of the insect world.

United States Department of Agriculture—Bureau of Entomology:—Bulletins:—

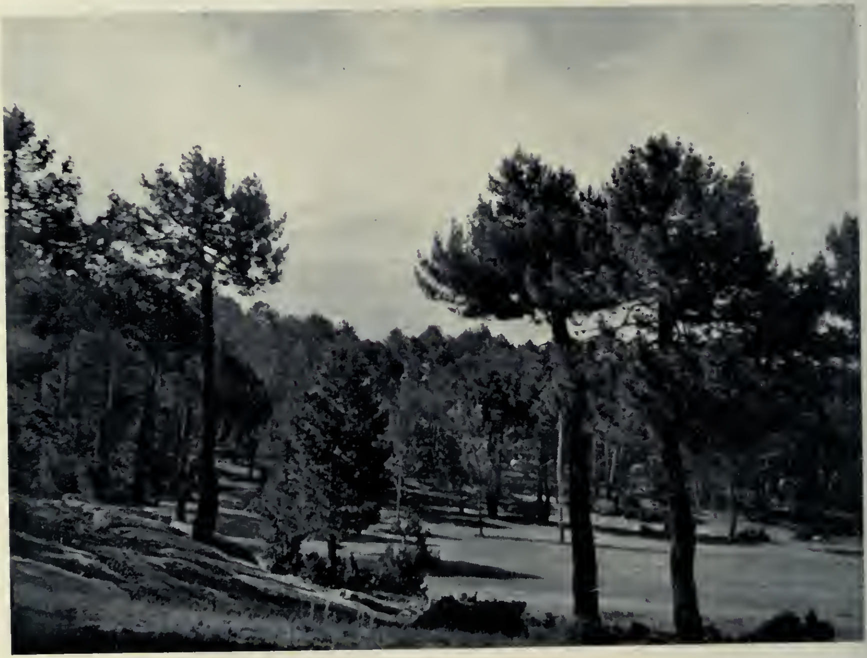
No. 96. Parts i–iv. "Papers on Insects affecting Stored Products." By F. H. Chittenden. (March–October, 1911.)
No. 97. Parts i–v. "Papers on Deciduous Fruit Insects and Insecticides." By F. Johnson, S. W. Foster, Dudley Moulton, & R. A. Cushman. (March–November, 1911.)
No. 99. Part i. "The Orange Thrips (*Euthrips citri*)." By P. R. Jones & J. R. Horton. (March, 1911.)
No. 104. "The Fig Moth." By F. H. Chittenden, Sc.D. "Report of the Fig Moth in Smyrna." By E. G. Smyth. (November, 1911.)
No. 105. "The Rocky Mountain Spotted Fever Tick. With Special Reference to the Problems of its Control." By W. D. Hunter & F. C. Bishopp. (November, 1911.)
No. 109. Parts i & ii. "Papers on Insects affecting Vegetables." By H. O. Marsh & F. H. Chittenden, Sc.D. (November, 1911.)

Technical series:—

No. 16. Part iv. "Catalogue of Recently Described Coccidæ."—iii. By E. R. Sasscer. (June, 1911.)
No. 19. Part iii. "Investigations into the Habits of Certain Sarcophagidæ." By T. L. Patterson. (March, 1911.)
No. 20. Parts i–iv. "Technical Papers on Miscellaneous Forest Insects." By A. D. Hopkins, Ph.D. & S. A. Rohwer. (January –May, 1911.)

The current "Transactions" of the Norfolk Society is a little disappointing entomologically, and contains but a single note on the occurrence at Carrow of the latest indigenous specimen of *Xylophasia zollikoferi*, under a large electric lamp. Five British examples are known from Deal to Yorks, and the species has a wide distribution from Germany to Central Asia, though always taken singly. We shall hope to find Rev. E. N. Bloomfield's important Catalogue of the Norfolk and Suffolk Diptera in next year's account of this thriving Society. The Ipswich Field Club is beginning to assert itself, early for so young an institution, and prints in its current Journal a capital list of Lepidoptera, taken in its vicinity by the Rev. A. P. Waller, B.A., who has, however, confined himself to the eastern side of the town, especially about Waldringfield, of which he is Rector. The most interesting note is anent *Leucania favicolor*, which he anticipates will be found nothing but a local form of *L. pallens*.

We much regret that we have to postpone publication of the biographical notice of the late Mr. S. J. Capper until next issue.



NEAR PUERTO DE LA LOSILLO, SIERRA ALBARRACIN.

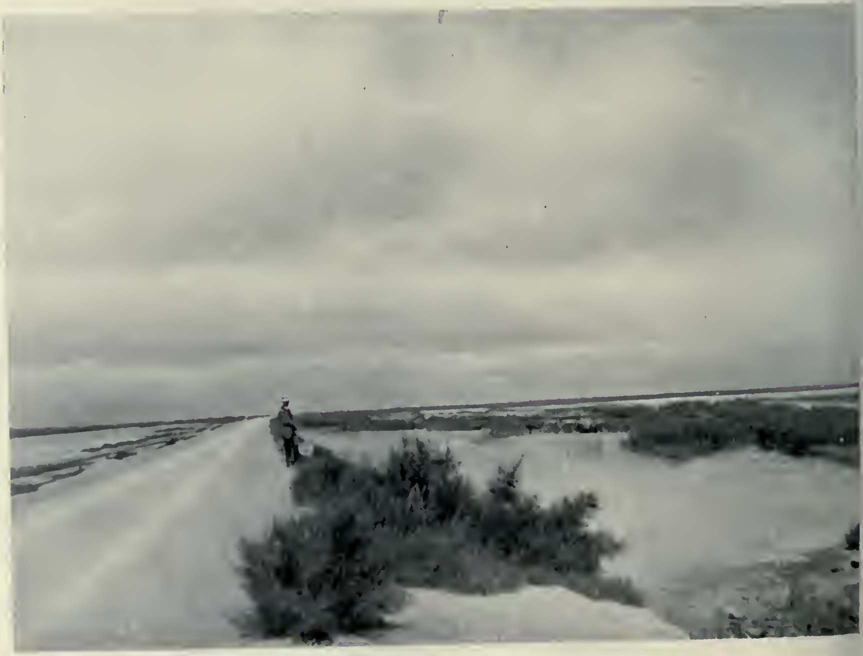


Photo Dr. Fr. Ris. IN THE CAMARGUE, NEAR LES SAINTES MARIES.

THE ENTOMOLOGIST

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A COLLECTING TRIP TO THE CAMARGUE AND THE SIERRA ALBARRACIN.

By Kenneth J. Morton, F.E.S.

(Plate III.)

On July 2nd last I joined my friend Dr. Ris, of Rheinau, at Lyons, our destination being Arles, in the Bouches du Rhône, which we reached early on the same day. In selecting Arles as the starting-point of a collecting trip which we had long planned, we had the belief that the Rhône delta would prove an excellent locality for Odonata, while we had also the idea that the chain of les Alpines might yield us a good Ascalaphid or two. We had even a faint hope that *Macromia splendens*, one of the least known, and accordingly one of the most interesting, of our European dragonflies, which apparently has not been taken at all in quite recent times, might be met with. Of these beliefs and hopes only the first was realized. The waters around Arles proved most productive of Odonata, but we did not see *Macromia splendens* at all, nor are we able to explain why we did not do so. Whether we were too far east, the character of the waters was unsuitable, or the season still too early, we are unable to say. The two recorded localities are Montpellier, in the not far-off Department of the Herault, and Jarnac, in the Charente; and probably we should have fared better had we tried one of these known localities. But my own feeling is that we were perhaps too early, as Williamson, in his excellent paper on the North American species of *Macromia*, states that on the Wabash River these magnificent insects appear on the hot days at the end of July and early August, when most of the other species of summer dragonflies have passed away—a state of things which, as the list that follows will show, had not yet come to pass at the time of our visit to Arles.

Our first attempt at collecting was made at the canal just outside of the town, and on most of the days that followed we spent a few of the morning hours profitably in the same place. Here we met with some of the most interesting small species in plenty, such as the two species of *Platycnemis*—*acutipennis* and *latipes*—the latter an especially delicate ivory-white species with a peculiar, weak, jerky flight. *P. pennipes* was not present at all. *Agrion lindenii* was also common here. Of the Gomphinæ, *Gomphus pulchellus* was common, *simillimus* much rarer, while a single male of *G. flavipes* was quite a distinguished capture. *Anax imperator* here and there patrolled the canal, but, as de Selys naively remarks, "cet insecte est d'une prudence remarquable." *A. parthenope* was also seen more rarely, and Dr. Ris picked up the exuviæ of this species. *Æschna affinis* occurred occasionally with an odd specimen or two of *Oxygastra curtisii*. Of the Libellulinæ, *Libellula fulva* and *Orthetrum cancellatum* were perhaps the most conspicuously common here, while *O. brunneum*, *O. cærulescens*, and *Crocothemis erythræa* occurred more sparingly. At this very convenient locality, towards the end of our stay at Arles, Dr. Ris made an interesting discovery in the shape of *Erythromma viridulum*. It was found settling in some numbers amongst poplar-shoôts which grew in a clump at one point of the canal-bank, and it might very easily have been overlooked. Later it was seen flying in its more normal fashion over the water, and settling on water-lily leaves. Another insect particularly common at one of the canal-locks was *Calopteryx splendens*, of an interesting form, similar to that which is found at Digne, somewhat intermediate between the type and the form *xanthostoma*.

On the afternoon of the 2nd we went further into the Camargue at Albaron, a station on the railway which goes to les Saintes Maries. All the way down we saw from the train many examples of what was doubtless *Æschna affinis* flying about, and at Albaron itself this species was in the greatest abundance. It is difficult to imagine one of the Æschninæ existing in greater numbers in any locality. Both sexes were represented. The other dragonflies noticed were not of great importance, but a single *Ascalaphus ictericus* was an interesting addition to our list for the day.

Another part of the district which we visited frequently was that lying around the station named Mas de la Ville, on the Saint Louis line. Here there were to be found, in addition to the canal, smaller ditches of diverse character, more or less overgrown with aquatic vegetation, and producing some species which did not occur nearer the town. At one of the minor ditches a few *Agrion mercuriale* and *Pyrrhosoma tenellum* were taken, while at another one or two *Calopteryx hæmorrhoidalis* put in an appearance. A shaded pathway running parallel to one of the greater ditches was a favoured haunt of the *Lestes* group. Here *L. viridis*, *barbara*, and *S. fusca* were common. Along the same pathway *O. curtisii* was found, but this species was disappointingly scarce. It is common in West Central

France (Indre and no doubt elsewhere), and it appears to be more especially an occidental species, although it is also recorded from Italy and Southern Spain. *Æ. isosceles* was a somewhat unexpected capture, some of the males being still in perfect condition. Looking to the time of its appearance in more northerly localities, its occurrence here in July was a little puzzling, and one or two other species, such as *L. fulva* and *L. quadrimaculata*, were equally a surprise to us at this date. The last-named occurred frequently in this district, and *Crocothemis erythræa* was very common. Anyone who has never before seen *Crocothemis* alive cannot fail to be struck by the beauty of the mature males of this tropical-looking insect. *S. sanguineum* was also a common insect in this quarter, in which the only Gomphine taken was *G. pulchellus* in great abundance.

We devoted one day to a visit to les Alpines. We took train to Fontvieille, and explored the hills lying between that place and Paradou. At the foot of the hills many Æschnæ were flying about, probably *affinis* and *mixta*. The butterfly-hunter would no doubt have found this a good locality (and very likely better still a little earlier in the season). I was sorry that we neglected butterflies, as our efforts to collect Neuroptera did not result in much. Flying in grassy places near olive-trees a small series of *Ascalaphus longicornis* was taken, and in one place we noticed a number of *Cordulegaster annulatus*, specimens secured proving to be of the var. *immaculifrons*, quite similar to those I have taken at Digne. *Æ. mixta* (female) was taken in the hills.

An excursion to les Saintes Maries, on the Mediterranean, which enabled us to see something more of the great wastes of the Camargue, was of little consequence from a collecting point of view. But even in this region, where arid tracts sparkling with saline efflorescence are the most conspicuous feature, dragonflies were not altogether absent, such species as *Anax imperator*, *Orthetrum cancellatum*, and *Lestes barbara* having been observed.

The following is a full list of Odonata seen and with one exception (*Anax parthenope*) taken in the Bouches du Rhône between July 2nd and 10th :—*Calopteryx splendens*, Harris ; *hæmorrhoidalis*, V. d. Lind. *Lestes viridis*, V. d. Lind. ; *sponsa*, Hansem ; *barbara*, Fab. *Sympycna fusca*, V. d. Lind. *Platycnemis acutipennis*, Selys ; *latipes*, Ramb. *Agrion lindenii*, Selys ; *puella*, L.: *pulchellum*, V. d. Lind. (one female) ; *mercuriale*, Charp. *Erythromma viridulum*, Charp. *Pyrrhosoma tenellum*, Devillars. *Ischnura elegans*, V. d. Lind. *Cordulegaster annulatus*, Lat. *Gomphus simillimus*, Selys ; *pulchellus*, Selys ; *flavipes*, Charp. . *Æschna affinis*, V. d. Lind. ; *mixta*, Lat. ; *isosceles*, Müll. *Anax imperator*, Leach ; *parthenope*, Selys. *Oxygastra* *curtisii*, Dale. *Orthetrum cancellatum*, L.; *brunneum*, Fonscol.; *cœrulescens*, Fab. *Libellula fulva*, Müll.; *quadrimaculata*, L. *Crocothemis erythræa*, Brullé. *Sympetrum sanguineum*, Müll.; *meridionale*, Selys; *fonscolombii*, Selys.

Of four *L. quadrimaculata*, two are ab. *prænubila*; another has the nodal spot just indicated, while the fourth has this spot very large, extending to 7 mm. in the hind wings.

Leaving Arles on the evening of July 10th, we proceeded to Albarracin, in the province of Teruel, by way of Cerbere, Barcelona, Sagunto, and Teruel. At ornamental waters in public gardens at Barcelona, dragonflies were about in some numbers, including *Anax imperator*, *Orthetrum cancellatum*, *Sympetrum fonscolombii*, and, I believe, one or two other species. We arrived at Albarracin on the 14th, and remained there until the 25th. This beautiful district has already been much written about by English entomologists, and its productions, especially in the way of butterflies, are well known. The Neuropteroid insects are also fairly well known, and quite a strong representation of these already existed in my collection, taken by Dr. Chapman, Miss Fountaine (through whose kindness I received a rather large collection), and Father Navás. In fact, we hardly added anything at all to what we previously knew of the "Neuroptera" of the district, and I fear we did not work so strenuously for these things as we ought to have done; they were not numerous (with a few exceptions), and the butterflies proved a counter-attraction at times irresistible.

On the way to Albarracin we had an afternoon at Teruel, and there we found three dragonflies in abundance, viz. *Calopteryx splendens* (race *xanthostoma*), *C. hæmorrhoidalis*, and *Onychogomphus uncatus*. In the valley of Guadalaviar, near Albarracin, *C. splendens* and *O. uncatus* were also common. Members of the genus *Sympetrum*, including *striolatum*, *meridionale*, *fonscolombii*, and *flaveolum*, *striolatum* preponderating, swarmed; and multitudes of these might be seen settled on the telegraph-wires, basking in the very early morning sunshine. Other species seen in the valley were *Lestes barbara*, *Sympycna fusca*, *Orthetrum brunneum*, and *Libellula depressa*. Examples of *Æschna* were occasionally seen, probably *mixta* and *cyanea* (the latter was taken by Miss Fountaine).

On the way to the Puerto de la Losillo we saw more than once *Cordulegaster annulatus*, but did not take any (the var. *immaculifrons* was received from Miss Fountaine), and at springs in an open grassy place amongst the pines, *Agrion puella*, *Ischnura graëllsi*, *Sympycna fusca*, and *Lestes dryas* were found. *Æschna mixta* (male) was also taken in an open part of the pine-woods.

The insects which interested us perhaps as much as any were the two species of *Ascalaphus*—*longicornis* and *bœticus*. They were seen in many different places, but in some rough overgrown spots near the river a few miles below Albarracin they existed in great numbers. They were given to occasional long soaring flights, beautiful manifestations of activity and life. When on the wing they were by no means easy of capture, but my observant friend, who always seemed to achieve maximum results with a minimum of exertion, found out another way. Settling quietly after a flight, they rest on stems for a brief space with fully outstretched wings. They are then conspicuous and easy to take until the wings are gradually closed over the back, when they become more difficult to see. One large example of *A. longicornis* was captured in the grip of an Asilid fly.

The following other Neuroptera were taken:—*Chrysopa prasina*, *lineolata*, and *vulgaris*; *Hemerobius humuli*, *H. stigma*; one example of *Dilar* (taken by Dr. Ris), probably *meridionalis*; *Macronemurus appendiculatus* and *Creagris plumbeus*.

Plecoptera were represented by *Perla marginata* and *Chloroperla grammatica* at the Guadalaviar, while a good series of *Nemoura fulviceps* was found at a small stream on the way to Puerto de la Losillo.

Probably the Guadalaviar produces more species of Trichoptera earlier in the season. *Hydropsyche lepida* and *Metalype fragilis* were common, and flew to the lights in the Posada. Other species were *Hydropsyche instabilis* and *guttata*, and *Sericostoma vittatum*, the last-named being common at the small stream above mentioned. The only example of Hydroptilidæ taken was unfortunately lost.

Going over ground that has been so well worked by experienced lepidopterists, little that is novel can be expected in the record of our doings amongst the butterflies. No doubt we overlooked much and made some mistakes. Amongst many specimens of *Melanargia lachesis*, I find but one pair of *M. japygia*. Of course, the latter may not have been fully out. On the other hand, *M. ines* was found here and there, mostly in rather chipped condition, it is true, but the species appears to have been missed altogether by most of our predecessors. A single specimen of *Cœnonympha iphioides* occurred in a meadow-like opening in the woods near the Puerto de la Losillo. We appear to have expended a tremendous amount of energy on *Satyrus briseis*, the result being a long and fine series, while of the much-desired *S. prieuri* my total catch amounts to only three males, and my colleague reports that his is about the same. On the whole, however, we seem to have met with most of the species that were to be looked for at the time of our visit.

On our way back from Albarracin we spent part of a day at Narbonne. Neither of us was particularly fit, and it began to dawn upon us that there might be something in the remarks that we had been hearing about the heat! We had practically no collecting, but it was interesting to see *Sympetrum fons-*

colombii, both sexes, in abundance here. Other species which were common were *Calopteryx splendens* (the southern form, different from that found at Arles), *Agrion lindenii*, and *Platycnemis latipes*.

BRITISH ORTHOPTERA IN 1911.

By W. J. Lucas, B.A., F.E.S.

(Plate IV.)

Though nothing of special importance occurred during the year just passed in connection with the British Orthoptera, yet a few facts which have come to my knowledge should, I think, be put on record; for it is only by persistent observations, each one of little consequence perhaps in itself, that we shall ever become well acquainted with the distribution and habits of the British examples of this important Order of insects.

Forficulodea.—On July 16th Mr. J. R. le B. Tomlin sent me some specimens of the little earwig (*Labia minor*), which he said were then common in his garden at Reading. Of the common earwig (*Forficula auricularia*), Col. J. W. Yerbury brought me a few examples from the North of Scotland. One fine large male was taken at Spey Bridge on July 31st. Large specimens of the var. *forcipata* are not infrequent, but this is, I think, the finest example of the normal form that I have seen. Its total length is 20·5 millimetres, 5·5 of them being due to the callipers, which are of the ordinary circular shape. There were also two nymphs of the same species, "swept in a damp shady spot" at Lochinver on July 11th, and two other nymphs "found under stones and cow-dung near Glencanisp Lodge," Lochinver, on June 21st. On October 14th I took a female of this species on ivy-blossom in a garden at Eltham, in Kent. Mr. Burr tells me that he took *Apterygida albipennis* in 1911, at Beachborough, behind Folkestone, in Kent.

Blattodea.—During 1911 the cockroaches have not been to the fore, and I have but a single note. Mr. Burr, writing early in February, 1911, told me that, on January 31st, when the "country was iron-bound in a black frost," he found *Blattella germanica* and *Blatta orientalis* swarming within a rubbish-heap in a brick-yard near Cheriton, Kent. Though the weather was very cold, the fermentation in the large heap of ashes and refuse produced much heat. In this case, of course, the congenial warmth accounts for the presence of these cockroaches out-of-doors. To find such insects, which are not indigenous with us, under these conditions at any time is very unusual, and much less do we expect to meet with them abroad in the winter.

Gryllodea.—*Gryllotalpa gryllotalpa*, the mole cricket, appears to be seldom noticed in Britain, though it is possibly not so scarce as this would imply. Like its namesake with the velvet fur, it is an underground animal, and may therefore very easily escape notice. I know of but one locality where it is permanently established. At a spot in the neighbourhood of Ramnor, in the New Forest, one of the keepers seems at any time to be able to obtain specimens by digging for them in the clayey soil. It is from this source that Mr. A. J. Scollick obtained a nice specimen in July last, whose extreme length was about 50 millimetres, while the expanse of its wings was about 66·5. Perhaps other entomologists may know where this—one of the finest of British insects—has permanent colonies. Mr. J. G. Dalgliesh is accustomed to receive living examples from Guernsey. Figures are given to enable anyone unacquainted with the insect to identify it. On November 12th last I received from Mr. G. T. Lyle a male specimen of the little "wood-cricket" (*Nemobius sylvestris*), which he found hopping about amidst fallen leaves, on the 5th of the month, in Pignall Wood in the New Forest. It seems quite likely that this insect may, to some extent at least, hybernate as an imago, for Mr. Lyle also found, in the New Forest, on February 12th, 1910, a female imago, which he fowarded to me alive (*vide* Entom. vol. xliii. p. 98). On August nights in the Forest, when scarcely a living thing betrays its presence by sound, a quiet chirping is occasionally heard, which I presume is due to this little cricket.

Locustodea.—Writing from the New Forest on October 19th, Mr. Lyle told me that, while sugaring that evening at 6.45, he noticed a grasshopper, *Meconema thalassinum* (= *varium*), ovipositing in the chinks of the bark of an oak-tree. The ovipositor was inserted to half its length. A second insect was also noticed in a similar position on a neighbouring tree. I suggested that, since it was not possible to obtain a photograph at night, Mr. Lyle should make an accurate sketch of the insect as it was probing the bark, and, having mounted a specimen in exactly the same position, photograph it at home. This he had no difficulty in doing, for on visiting Holland's Wood a night or two afterwards, the grasshopper could be found ovipositing on every fifth or sixth tree. This plenty continued till October 27th, but when Mr. Lyle paid another visit on November 14th he could not detect a single individual. Writing on July 15th, Mr. H. Campion reported to me a case of cannibalism in a Locustid grasshopper. Two specimens of *Metrioptera brachyptera* were taken by Mr. South at Oxshott, on July 1st. One cast its skin in a glass-bottomed box and later made a meal of the skin. For some days the two specimens of *M. brachyptera* were kept in a fish-globe with a *Gomphocerus maculatus*, also from Oxshott. One night the *G. maculatus* looked a little sluggish. The next morning it was dead, and one of the Locustids was feeding on it (*vide* Entom. vol. xliv. p. 275). In August Mr. South took a single specimen of the very scarce *Metrioptera roeselii* at Leigh, in Essex.

Acridiodea.—Short-"horned" grasshoppers are usually more in evidence than those with the long antennæ, and fresh references to the former have therefore been the more numerous during the past year. Mr. S. E. Brock records *Gomphocerus maculatus* from Linlithgowshire, at Craigton (plentifully), at Priestwich, and at Linlithgow; and notes that it was already stridulating on June 25th. Personally, I did not notice it mature till July 10th, when it was found just outside the 'Hand and Spear' at Weybridge, on the evening of the Entomological Club Supper at that well-known hotel. Mr. W. Evans took the female* at Aberdour, in Fife, on August 15th. Colonel J. W. Yerbury sent me eighteen specimens from Nethy Bridge—a male and female taken on August 9th; five males and seven females on August 11th; and two males and two females on the 18th. I received a female from Mr. K. J. Morton, taken at Llanfaethlu, in Anglesey, August 1st–7th, 1911. Rev. F. C. R. Jourdain took a female in the late summer, at Dovedale, in Derbyshire. *Omocestus viridulus* is reported by Mr. Brock from Drumshoreland, in Linlithgowshire, and from Craigton in the same county plentifully. Mr. Evans took both male and female at Aberdour, in Fife, on August 15th. Colonel Yerbury sent me, from Nethy Bridge, a male taken July 30th; a male, August 9th; a male and four females, August 11th. Mr. Jourdain took a female in Dovedale. Of *Stauroderus bicolor* Mr. Evans took the female, at Port Seton, in Haddingtonshire, on August 11th, and both male and female at Waughton, in the same county, on October 14th (his latest date for the species). Colonel Yerbury gave me three specimens, two males and a female, of a dull reddish brown tint, taken October 13th, in Cornwall, at Downderry, which is on the shore of Whitesand Bay, between Plymouth and Looe. Mr. Morton sent me a male taken at Llanfaethlu, in Anglesey, August 1st–7th. A male was taken in late summer by Mr. Jourdain at Dovedale. Mr. Brock says that *Chorthipphus parallelus* was in considerable numbers at Drumshoreland, in Linlithgow, being in full "song" on July 10th. Colonel Yerbury sent four nymphs, taken at Lochinver on July 1st, 4th, 12th, and 22nd, all of which must no doubt be referred to this species. *Mecostethus grossus* seemed to be mature in the New Forest somewhat earlier than usual, as, of course, was to be expected. Several females of *Tetrix bipunctatus* were secured in West Perthshire, at Lochard, by Mr.

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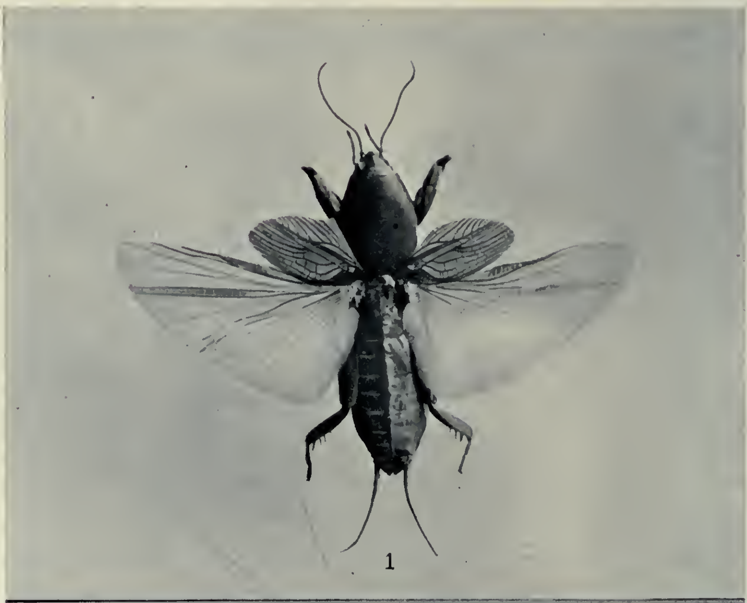
* In this and similar cases, unless it is expressly so stated, it must not be supposed that only the individuals mentioned were in evidence, or that the sex not mentioned was absent from the spot at the time.

The Entomologist, April, 1912. Plate IV.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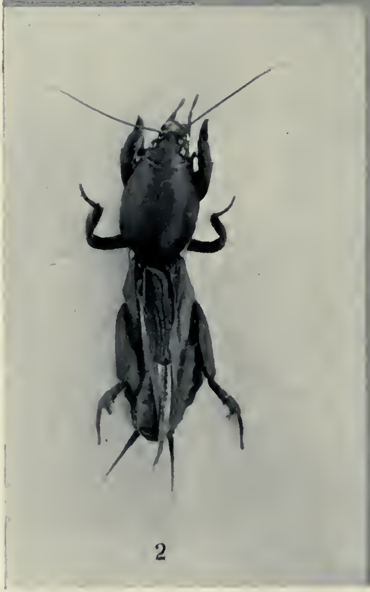
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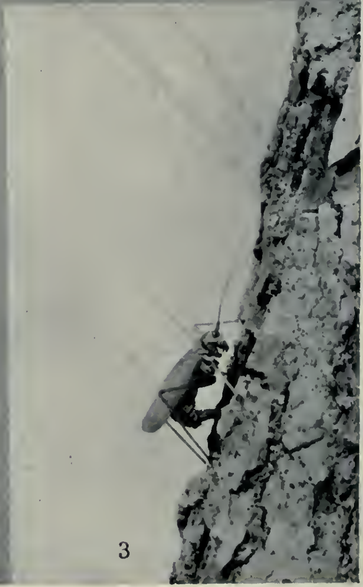
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W. J. Lucas
H. Main } photo
G. T. Lyle

West, Newman proc.

1. Gryllotalpa gryllotalpa (Mole Cricket), wings spread.
2. G. gryllotalpa, wings folded.
3. Meconema thalassinum, ovipositing. All nat. size.

Evans, on May 27th, while Colonel Yerbury sent me a specimen with broad yellowish stripe along the middle of the pronotum, taken at Lochinver on June 20th; and one very dark example with pronotum extending a little beyond the hind knees, taken at Nethy Bridge on August 9th. This latter looked as if it might be *T. fuliginosus*, but the announcement of this insect as British is not yet to be.

In the hot sunshine of July 11th, on the downs near Clandon (Surrey), and again in the New Forest, when the sun on August 7th was very bright and very hot, especially in sheltered places, I particularly noticed that grasshoppers were chirping merrily; yet Tennyson writes:—

> " For now the noonday quiet holds the hill
> The grasshopper is silent in the grass";

while another author, speaking of "autumn calm," says:—

> " Scarce a chirping grasshopper is heard
> Thro' the dumb mead."

On the other hand, Keats writes:—

> " When all the birds are faint with the hot sun,
> And hide in cooling trees, a voice will run
> From hedge to hedge about the new-mown mead
> It is the grasshopper's . . . "

Can these three statements be reconciled?

Description of Plate IV.

Gryllotalpa gryllotalpa, with wings spread.
,, ,, with wings closed.
Meconema thalassinum ovipositing.

Kingston-on-Thames: February, 1912.

NOTES ON BRITISH OCCURRENCES OF *METRIOPTERA (PLATYCLEIS) ROESELII*, Hagenb. (Orthoptera).

By Herbert Campion.

On August 1st, 1911, Mr. R. South was fortunate enough to take a fine male of this scarce British Locustid near Leigh, Essex. It was found amongst long dry grass at the foot of one of the ramparts which serve as sea-walls on that part of the coast. A few days later—August 10th—he revisited the locality, and spent a considerable time in searching for further specimens, but without success. Mr. South very generously gave me his single example, which I received alive. I fed it upon fresh grass, and it was still quite active when I killed and set it on August 21st.

As this species is so little known to British entomologists as a living insect, and in view also of the fugitive character of its coloration, it may be useful to place on record the colour-characters of the Essex male, which were as follows:—

Head ash-colour. Palpi brownish. Eyes brownish black, with a horizontal black streak above each, partially bordered below with yellow. Antennæ light brown. Pronotum pale brown; side-flaps black, edged all round with bright yellow. Elytra lightly tinged with brown; principal longitudinal nervures black. A pair of bright yellow spots on each side of the thorax. Legs light brown; black lines on hind femora; inferior surface of tibiæ of fore and mid legs greenish. Abdomen dorsally and superior appendages dull brown; ventral surface and inferior appendages deep yellow; a row of light yellow markings along each side of the abdomen.

Leigh can now be added to the very few British localities hitherto recorded for *M. roeselii*, which seems to show a preference for the East Coast. It is not to be assumed, however, that this distribution is due to immigration from the Continent, as that supposition appears to be excluded by the ill-developed condition of the wings in this Decticine.

From Trusthorpe, Lincolnshire, Mr. Eland Shaw received specimens taken in August, 1888 (Ent. Mo. Mag. s. i. p. 96, 1890).

At Herne Bay, Kent, the species has been met with by more than one collector. Mr. E. Saunders took a specimen in August, 1886 (Ent. Mo. Mag. *loc. cit.*), and a male contained in Mr. Guermonprez's collection is recorded in Entom. xxx. p. 28, 1897. Another isolated specimen, a female, was obtained by myself on September 13th, 1907 (Entom. xl. p. 255, 1907), although I have never been able to re-discover the species in or about the locality where I took it in that year. Mr. Charles O. Waterhouse, however, appears to have found the insect in some numbers, for the British Museum cabinet of British Orthoptera contains seven examples (five males and two females) of *roeselii* from its Kentish haunt. These formed part of a collection of eighty insects of various kinds made by him in the neighbourhood of Herne Bay at the end of July and the beginning of August. The collection is registered as having been presented to the Museum in 1887, and Mr. Waterhouse tells me it is almost certain that his specimens were taken in that year, the great majority of them in the month of July. A female pupa, taken on the same occasion, is now, through the kindness of Mr. Waterhouse, in my own collection.

With Mr. Waterhouse's specimens are placed a pair derived from Stephens' collection. As was to be expected, they are without data, but the male carries the printed name "Roeselii, *Hage.*" Dr. Malcolm Burr has been good enough to examine the specimens for me, and has pronounced both of them to be correctly identified as *roeselii*. All that is discoverable concerning their history is contained in the following passage from Stephens:—"This species appears to be very rare in this country. I have hitherto seen, so far as I remember, two examples only, which are in my own collection, and were found in the vicinity of the Metropolis in the autumn, I believe at Hampstead" (Illus. Brit. Ent. Mandib. vi. p. 13, 1835).

In 1850, J. C. Dale presented to the British Museum, among other insects, a pair of *Metrioptera* from Parley Heath, Hants, which were believed to be "*Acrida brevipennis*," Charp. (= *M. roeselii*, Hagenb.), and were referred to under that specific name in Walker's Cat. Derm. Salt. in B. M., part ii., p. 256 (1869). In the Museum collection, however, the specimens stand over the name *brachyptera*, Linn., and Dr. Burr has kindly informed me that they are correctly placed.

Assuming that Mr. Waterhouse's specimens were taken in July, it follows that the ascertained seasonal range of *roeselii* in this country extends from the latter part of that month to September 13th, the date noted by myself. Judging by analogy with allied species, however, our insect might be expected to survive until about October.

58, Ranelagh Road, Ealing: March 2nd, 1912.

SOME BEES OF THE GENUS *NOMIA* FROM AUSTRALIA.

By T. D. A. Cockerell.

Nomia flavoviridis, Cockerell.

I have before me a series of eight males and seventeen females collected by Turner at Mackay, Queensland; some of the females from flowers of *Cassia* and *Xanthorrhœa.* I have also eight males from Cooktown, October, 1902 (Turner), four males from Townsville (Dodd), and a female collected at Cheltenham, Victoria, by French (Froggatt collection, 96). The abdominal bands vary in colour from pale yellowish to white in the males, and in the females are frequently orange. Both sexes are occasionally only rather feebly metallic. So far as can be gathered from Smith's brief account of male *N. ænea* from Port Essington, the only conspicuous and constant difference between that species and *N. flavoviridis* is found in the hind femora, which in *ænea* are more slender than in male *flavoviridis*, and have the apical part much more narrowed and elongated.

The great variability of *N. flavoviridis* makes the classification of the varieties difficult. None of the specimens now before me are var. *adelaidella*, Ckll. The typical *flavoviridis* is represented only by two males and a female from Mackay, characterised by the clear rufo-fulvous or apricot colour of the tegulæ, and in the male by the red tibiæ (wholly red or stained with metallic greenish) and tarsi. The female has pale orange hair-bands. The other specimens all have darker tegulæ, and the legs show more dark colour, being better described as dark stained with reddish. The colour of the body seems quite inconstant, the Mackay males varying from green to deep blue. It therefore seems impracticable to maintain the variety *doddii*, Ckll., unless it is considered to include all of the Queensland material excepting the three typical *flavoviridis* cited above. The female from Victoria is olive green, and has the face narrower than usual. Three females from North-west Australia (French) have very broad faces; they perhaps represent a distinct race.

Nomia frenchi, sp. n.

♂. Length about 7½ mm., expanse nearly 18; black, densely punctured, with dull white and black hair; antennæ very long, entirely black; clypeus black, somewhat bigibbous, shining, with elongate punctures; labrum and mandibles ferruginous, the latter black at tip; tongue narrow, moderately long; hair of face white, strongly plumose, of vertex fuscous, of occiput white; mesothorax uniformly densely punctured, with a thin short mouse-coloured tomentum, and longer black or dark fuscous hair; scutellum with long dark hair; other parts of thorax with pale hair; basal transverse canal of metathorax quite broad, shining, very finely fluted; apical triangular part of enclosure smooth and shining; tegulæ rather large, bright ferruginous, pointed behind; wings dusky translucent, nervures and stigma ferruginous; first r. n. entering apical corner of the narrow second s. m.; femora black, tibiæ and tarsi ferruginous, the middle and anterior tibiæ suffused with dusky; hind femora thickened, smooth, flattened and longitudinally concave beneath; hind tibiæ thickened, trigonal, the lower margin obtusely angled about the middle; abdomen black, densely punctured, the hind margins of the second and following segments smooth, the fourth and fifth becoming brownish; fourth ventral segment emarginate; no ventral tubercles or teeth.

Hab. Woodend, Victoria, 1909 (French). Froggatt collection, 92. A distinct species, readily separated from *N. generosa*, Smith, by the enlarged hind femora and tibiæ, and the dark hair on the thorax above; and from *N. argentifrons*, Smith, by the black flagellum, the red tibiæ and tarsi, &c. The abdomen has greyish-white hair-bands on the second and following segments, that on the second broadly interrupted, but the basal parts of the third and following segments have long coarse black or dark fuscous hair.

Nomia satelles, sp. n.

♂. Length about 8½ mm.; black, finely and closely punctured; hair on face dense, shining, with a yellowish-grey tint, on thorax above of the same colour, with scattered dark hairs intermixed, on pleura and sides of metathorax thin and white; tongue elongate dagger-shaped; lower half of clypeus, and mandibles except at base, honey-colour; vertex and cheeks very narrow; antennæ long, the flagellum entirely ferruginous, but darker above; mesothorax shining between the close small punctures; basal transverse channel of metathorax shining, crossed by numerous strong ridges; apical triangle of enclosure small, smooth; tegulæ rather large, apricot colour, the margin paler; wings hyaline, faintly dusky; nervures and stigma ferruginous, first r. n. joining apical corner of second s. m.; legs with coarse white hair; knees and tarsi clear ferruginous, tibiæ ferruginous at each end, as also anterior pair in front, and hind ones largely behind; hind femora swollen, shining; hind tibiæ swollen, trigonal, but wholly without the median tooth or tubercle found in *N. smithella*, Gribodo; abdomen finely but very distinctly punctured, with very broad pale orange hair-bands on the hind margins of the segments except the first, which has only an elongate patch on each side; venter without teeth or tubercles, hind margin of fourth ventral segment concave.

♀. Length about 9½ or 10 mm.; similar to the male except for the usual sexual differences; hair on last two abdominal segments pale purplish-sooty, but the orange bands on the other segments as in the male; mesothorax with very minute punctures, and scattered large ones; mandibles dark; flagellum dark above, clear furruginous beneath; hair on inner side of basitarsi fulvous.

Hab. Type (male) from Rutherglen, Victoria, 1909 (French); Froggatt collection, 84. Female from Mittagong, New South Wales, January 10th, 1902 (Froggatt, 73). This species resembles *N. australica*, Smith, from which it is easily known by the smaller size and black colour. The first abdominal segment of the female is closely and finely punctured on the disc as in typical *australica* from New South Wales.

Nomia kurandina, Ckll.

I have a male from Kuranda, Cairns, March, 1902 (Turner), and two females from Mackay, Queensland, November, 1891, and May, 1900 (Turner, 1078). The female, not before known, is exactly like the male except for the usual sexual differences, and the more dilute dark apices of the wings. The clypeus and supraclypeal area show a strong median ridge. The mesothorax has very fine punctures, with scattered larger ones.

Nomia semiaurea, Ckll.

Mr. Turner collected females in Queensland, at Mackay, March, 1900, and at Cairns (Kuranda), April, 1902. At Kuranda, February, 1902, he collected a male *N. rufocognita*, Ckll. When describing *N. semiaurea* I suggested that it might possibly be the female of *rufocognita*, and I am now of the opinion that this is really the case, though actual proof is wanting.

Nomia halictella, Ckll.

The male, hitherto undescribed, was taken at Mackay, January and March, 1900 (Turner, 314). It has a subclavate abdomen, and resembles *N. pseudoceratina*, Ckll., but is smaller (length about or hardly 8 mm.), with the first abdominal segment only about as long as broad; hind knees and base of their tibiæ ferruginous; hind femora and tibiæ quite simple.

University of Colorado, Boulder:
January 18th, 1912.

NOTES ON THE LIFE-HISTORY OF *COLIAS NASTES* VAR. *WERDANDI*, WITH DESCRIPTION OF OVA AND LARVA.

By W. G. Sheldon, F.E.S.

Whilst staying in Swedish Lapland last summer I searched for and succeeded in finding ova of this species. The first ova, ten in number, were found on June 23rd in a sheltered spot on the shores of the Torne Träske, where its food-plant, the handsome *Astragalus alpinus*, grew abundantly. Most of the ova were found on the leaflets of the *Astragalus*, some on the upper and some on the lower surfaces, but in two cases they were attached to a leaf of *Vaccinium myrtillus*, which was an inch or two away from the food-plant. I did not search further for ova for some days, the supply obtained appearing sufficient for the time being, but in early July I sleeved several females, which deposited sparingly on the food-plant. I commenced to search again on July 10th, but by this date the bulk of the larvæ had apparently emerged, for several hours' search only revealed five ova, all of which hatched during the next day or two.

The ova is of a pale straw-colour when deposited, gradually changing to deep orange in a few days, and shortly prior to emergence to dark leaden tint. It is upright, and of the usual *Colias* shape and character. The vertical and horizontal diameters are 1·25 millim. and ·65 millim. respectively; it has a number of vertical ribs, the distance these are apart is about ·05 millim.; numerous transverse ribs connect the vertical ones. The diameter of the apex of the ova is ·15 millim. The micropylar area consists of a number of very shallow cells; it is not perceptibly depressed. The surface of the ova is highly glazed; that portion which from the position in which it is held reflects the light is tinged with mother-of-pearl.

This stage appears to last about twelve days, for one ova I had continuously under observation was, when found on June

23rd, of a pale straw-colour, and had evidently only just been deposited; the larva emerged on July 5th.

The newly emerged larva is barely a millimetre in length; it is of brownish green colour, with head black and shining. It is covered with tubercles, each tubercle emitting a white spine. I at once placed it upon a leaf of *Astragalus*, on which it commenced to feed, forming a small semicircular notch on the edge, and then stretched itself out at full length on the upper surface of the midrib of the leaflet.

On July 6th the larva had fed during the preceding night, which, it must be remembered, was as light as at noon; it remained during the day stretched out as before.

On July 7th the larva had not fed or moved, but after this day, until July 12th, it fed slowly, eating round holes in the leaflet, always from the upper side; when moved to change the food, which had to be done daily, the larva invariably stretched itself on the upper side of the midrib of a leaflet. From July 12th to the 16th it remained quiescent; on the latter day the change into the second instar occurred. It was during this stage of practically the same appearance as during the previous instar, except that on the 16th its length had increased to 2 millim.

From July 18th to 28th I was travelling to England, and could thus only imperfectly observe the progress. By the time I had reached Christiania, on July 24th, the plants of *Astragalus* I had brought from Abisko were yellow and unfit for food. I was therefore forced to attempt to discover a substitute. The only leguminous plant I could find was the common white clover, *Trifolium repens*, which fortunately the larva took to quite naturally, and upon which it fed freely thereafter.

On July 31st the larva changed into the third instar. On August 2nd it was 5 millim. long; the head was light yellowish green, thickly studded with tubercles, each of which emitted a black spine; the remainder of the segments were dull green, with faint darker dorsal and subdorsal lines and light spiracular stripes. The whole of this area was thickly covered with white tubercles, each emitting a short spine. The ventral area was of the same tone of green as the dorsal. During this stage the larva fed chiefly on the upper epidermis of the clover-leaves, and hung by a thread when shook off.

On August 5th it ceased feeding, and prepared to change into the next stage. On the morning of August 6th I found it had changed during the night into the fourth instar. It was then 6 millim. long, of a decidedly darker colour than in the preceding instars, with the dark dorsal line not so apparent; the subdorsal lines were now light coloured, almost as light as the spiracular line, which itself was much lighter than in the preceding stages; the head was light green, as in the last stage;

both head and general area were thickly covered with tubercles and spines, the tubercles in the general area being white in colour. The dorsal area between the subdorsal stripes was slightly narrower towards the head, and considerably more so towards the anus. The light spiracular line was narrow.

In this stage the larva ate the whole of the clover-leaf away, leaving the midrib only. On August 11th it ceased feeding preparatory for the next change; it was then 13 millim. in length, and stout for its length. The spiracular line was now much more prominent, white, and tinged towards the anal extremity with orange; the spiracles were brown, the subdorsal lines cream-colour; the general area green, of the colour of a clover-leaf; the head was lighter and duller green, the spines on it were black.

The larva changed into the fifth and last instar on August 12th; immediately this occurred it was 13 millim. in length; the head was now of the same green colour as the clover-leaves; the remainder of the segments were very dark moss-green, with the white spiracular and light yellow subdorsal stripes showing much more prominently than in the previous stages; it was thickly covered with white tubercles emitting black spines. The spiracles were now light crimson, especially those nearest the anal extremity. During this stage the subdorsal stripes were red on the upper sides, except for a few segments next the head, on which they were yellow; these tints were caused by the tubercles in the upper portion of the stripes being red or yellow respectively. The spiracular stripe was tinged with light crimson on the lower border from end to end; neither subdorsal or spiracular stripes extended through the anal segment; the spiracles were brown.

In this stage the larva grew with great rapidity, and on August 15th it had increased in length to 23 millim.; the width was then 4 millim. The colour was still moss-green, but of not so dark a tint as when last described. The subdorsal stripes were now red on the upper borders for the whole length.

On August 17th the larva had attained a length of 26 millim., and was then apparently full-grown. On this day it ceased to feed, and remained stretched out at full length upon its food, evidently being prepared to hybernate, had its natural conditions been obtained. Unfortunately, I could not manage to bury it for the succeeding nine months under several feet of snow, and keep the surrounding temperature many degrees below freezing-point. The best I could do was to place it on a piece of muslin in an airy cage and keep this in a cool cellar. Under these conditions the larva remained quite quiescent, and gradually decreased in size, until at the end of September it was only 13 millim. in length.

On December 18th it was apparently healthy, and had not decreased further in size, but by December 25th, when my next inspection took place, it was dead.

The only other larva that reached the hybernating stage was similar in all respects to the one above described, except that it was entirely devoid of the light yellow subdorsal stripes ; in place of these in all stages it had the dark subdorsal lines that characterized the third instar of the first larva.

From the above observations it appears evident that the larva of this species hybernates as a full-fed larva. Assuming that it must hybernate as a larva at all—and all the *Colias* species I am acquainted with do pass the winter in this stage—then the reason is evident, for the whole of its habitat is covered with snow several feet deep from September until May, and the winter frosts are so intense that every herbaceous plant is cut down and killed to the ground ; therefore, on the snow melting in the spring, there would be nothing for the larva to feed upon.

It has been stated in a German magazine that the food-plant of *Colias* var. *werdandi* is *Oxytropis lapponica*. This is certainly an error, for two extremely competent Swedish botanists who were at Abisko in July last not only identified it as *Astragalus alpinus*, but informed me that *O. lapponica* is not found in Swedish Lapland, nor is it mentioned in the 'Flora Lapponica' of Linné. *A. alpinus* is an exceedingly abundant plant at Abisko, and is the only leguminous plant I saw there.

It must be borne in mind that the Province of Tornea Lappmark, which appears to be the chief habitat of *Colias* var. *werdandi*, is practically without cultivation, anything in the nature of a meadow being unknown, except perhaps in the vicinity of the few small towns or villages, everything elsewhere being entirely mountain, moor, swamp, or forest, and from all these the leguminous plants of cultivation are entirely absent. In the 'Flora Lapponica' of Linné only nine species of this order are mentioned.

The above observations on the life-history of this species throw some light on a problem on which there has been considerable speculation amongst lepidopterists, *i. e.* how do the larvæ find time to complete all their stages during the very short Arctic summer? It has been suggested as a way out of the difficulty that many, if not all, of them may feed for two seasons. My observations on *Colias* var. *werdandi* seem to show, however, that some, if not the bulk, of the species feed rapidly whilst they have a chance, and pass the winter as full-fed larvæ or as pupæ. I hope, however, to throw further light on this question at a future date.

Youlgreave, South Croydon: February 10th, 1912.

NEW FOREST NOTES, 1911.

By G. T. Lyle.

In spite of there being some people who, after a visit lasting a week or so, return to their homes saying that the Forest is "played out," that insects are exterminated, &c., &c., it remains a fact that, year after year, entomologists and collectors flock to this favoured neighbourhood, and, if they "know the ropes," generally leave well satisfied with the results of their labours.

The locality is so well known to many of your readers that, possibly, a few notes by a resident may be of interest.

As regards the oft-repeated statement that many of our insects, once common, have disappeared, I can think of three only of which this may be true; these are *Aporia cratægi*, *Leucophasia sinapis*, and *Melanargia galatea.* The first of these can scarcely be considered properly indigenous to this country, although, undoubtedly, it often breeds here. It seems probable that some time in the last century migratory specimens reached the Forest from the Continent, and, under specially favourable climatic conditions, succeeded in establishing a colony, but that the first exceptionally cold, or more probably exceptionally wet, winter killed off the settlers.

Why *L. sinapis* should have disappeared is a mystery. We can scarcely blame the collector; more probably hymenopterous parasites were the culprits. It would seem that some thirty years have elapsed since a specimen was captured; but it may turn up again. Who knows? Stranger things have happened.

If we cannot understand the disappearance of *L. sinapis*, it is equally hard to understand why *M. galatea* should ever have occurred in the Forest; a more unlikely spot for this chalk hill-loving species would be hard to find.

As in other parts of England, mackintoshes and umbrellas were at a discount during the summer of 1911, for, with the exception of Coronation Week, scarcely any rain fell from mid-April to mid-October. Such a very warm and dry summer accounts, no doubt, for so many insects having produced an additional brood, or partial brood. The following instances have come to my notice:—

Pararge egeria. — There appear to have been four emergences, the last in late September and early October.

Porthesia similis.—I took a fresh male from a street-lamp on the evening of October 19th.

Cerura furcula.—This species would seem to be frequently double-brooded, or partially so, in the Forest, but this has never been more noticeable than in 1911, for during September the larvæ could be taken in numbers from sallow.

Triphæna pronuba.—Two fresh female specimens were taken at ivy-bloom on October 19th; one of these laid some four hundred ova on October 28th, which all hatched on November 29th.

Agrotis puta.—On October 21st I took a specimen at ivy, in very good condition.

Phyrxus (*Deilephila*) *livornica.*—The capture of a very fresh specimen on August 28th has already been recorded (Entom. vol. xliv. p. 365).

The following emergences occurred in captivity. In no case were the larvæ forced in any way.

Nemeobius lucina.—Three bred in late July; ova obtained in May.

Mamestra contigua.—A single specimen emerged early in September, one of a brood of seven reared from ova laid in June.

Hygrochroa syringaria.—As was to be expected, this species produced a second brood in captivity.

Ephyra annulata. — On October 10th a single specimen emerged.

Semiothisa alternata.—Several bred in August.

Acidalia straminata.—A second brood emerged at the end of August.

Bapta temerata.—Several bred in early August from wild larvæ taken a month previously. I think this must have had a partial second brood in a wild state, as I beat a larva on September 3rd.

The records of a second emergence of *Limenitis sibylla* (Entom. vol. xliv. pp. 363 and 328) particularly interested me, as I had been keeping careful watch for a second brood in the Forest. We were not favoured, however. Two or three larvæ found in September were no larger than is usual at that time of the year.

On September 4th I beat from oak a half-grown larva of *Nola strigula*, from which I certainly expected to obtain an autumn imago. Unfortunately, although it fed in captivity for some three weeks, it did not appear to increase in size, and eventually died. I have never before taken a larva of this species in the autumn; when beaten in early May they are usually almost microscopic.

In October and November larvæ of *Noctua brunnea*, *Triphæna fimbria*, *Aplecta* (*Mamestra*) *nebulosa*, *Metrocampa* (*Eudalimia*) *margaritaria*, *Boarmia repandata*, and several others, were noticed to have attained a very considerably larger size than is usual in the autumn. Several of these overgrown larvæ of *M.* (*E.*) *margaritaria* were kept, and produced in every case one or more parasites. The parasites have not yet emerged from their cocoons, but judging from these they are a species of *Apanteles.*

During the whole year the prevalence of parasites was quite a feature. Of twenty-five larvæ of *Agrotis strigula*, picked up one wet night in March, twenty-three produced a specimen each of the Braconid *Meteorus pulchricornis*, while quite fifty per cent. of the larvæ of *Hygrochroa syringaria*, taken in April and May, succumbed to the attacks of another Meteorid—a black insect with yellow legs, which appears to be nondescript.

Although I cannot hear of any great rarities having been taken at sallow, the number of beautiful forms of *Tæniocampa munda* that were captured amply repaid the collector, to say nothing of hybernated *Lithophane socia*, which were rather abundant. Sugaring in June and July was quite a failure. This was no doubt owing to the prevalence of honeydew, and to there not being sufficient rain to wash it off the leaves. In August, however, *Catocala sponsa* and *C. promissa* turned up in fair numbers, and in the autumn the usual things were plentiful, although *Lithophane socia* was scarcely seen. We were glad to welcome back *Eumichtis protea* after an absence of several years.

It is my opinion that *Apatura iris* was more common in 1911 than it has been for a long time. I have heard of twenty-seven specimens having been captured in the neighbourhood of Brockenhurst alone. The larvæ were correspondingly plentiful in the autumn, and probably quite a hundred were taken locally.

It is very pleasant to find that, in spite of the hordes of collectors who yearly thrash our sallow bushes for the larvæ, this fine butterfly is still holding its own. Perhaps it would be an exaggeration to describe 1911 as a "butterfly year," but in addition to *Apatura iris* several species were more than usually abundant, the most noticeable being *Pararge egeria*, *Argynnis paphia* and its var. *valesina*, *Zephyrus betulæ*, *Cyaniris argiolus*, and *Chrysophanus phlæas*.

As there still seems to be some little doubt as to the winter quarters chosen by *Gonepteryx rhamni*, it may be of interest to note that, on the evening of November 14th, when collecting with Mr. E. Morris (whom I must thank for much information which is embodied in this article), a specimen of this butterfly was discovered resting under an ivy-leaf some ten feet from the ground.* The insect was still in the same position on the night of November 28th, and was very easily seen by the light of an acetylene lamp, the wings appearing to reflect the light and to make the butterfly stand out very plainly. Finding it in the daytime, however, was a very difficult matter, so great was its resemblance in colour and shape to its surroundings.

On November 28th Mr. C. W. Colthrup discovered, while in my company, another hybernating *G. rhamni* in a similar position, but in this instance the insect was not more than three feet above the ground.

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* On February 14th this butterfly was still in the position noted, but on March 4th it had disappeared.—G. T. L., March 24th, 1912.

During the early spring *Hybernia leucophæaria* appeared in great numbers, and larvæ of *Boarmia repandata* were particularly plentiful at night. In the late spring many species of oak-feeding larvæ were not nearly so numerous as usual. This was again noticeable in the summer and autumn, when the larvæ of such species as *Stauropus fagi*, *Acronycta alni*, *Cochlidion* (*Heterogenea*) *limacodes*, and *Heterogenea asella*, were almost entirely absent. Luckily, larvæ of *Boarmia roboraria* and *Hylophila bicolorana* were plentiful. Referring to the larvæ of the latter species, it is, of course, well known that when hatched, and for some time afterwards, the young larvæ are green, and that they change to a brown colour before hybernation, so as to harmonize with their winter surroundings. It is generally imagined that this change of colour takes place at the last autumnal ecdysis, but I now find that it is not so, for the larvæ are quite as green after changing their skins as before. Very gradually the caterpillars cease feeding, become lethargic, and their green colour slowly fades, until they present a very washed-out appearance; then the brown pigment is "turned on," and the winter coloration assumed. The same thing may be noticed, though in a much less degree, with the larvæ of *Apatura iris*.

Although oak-beating in September was poor, birch and sallow yielded good results, larvæ of *Drepana falcataria*, *D. lacertinaria*, *Notodonta dromedarius*, *Ephyra pendularia*, *N. ziczac*, and *Cerura furcula* being abundant.

At the very spot where my friend, Mr. Bernard Piffard, took *Zygæna meliloti* some fifty-two or fifty-three years ago, I found, on May 28th, a dozen or more full-fed larvæ of this very local Burnet. The cocoons are difficult to see, for, unlike those of its near relative, *Z. filipendulæ*, they are placed low down in the herbage, the two or three that I have discovered having been attached to broad, flat, dead blades of grass. This spot, thirty yards square, seems to be the metropolis of the species, although it would appear that at various times colonists have been sent out or wandered away, and have for a time established themselves elsewhere in the neighbourhood. At any rate, it is the only place where *Z. meliloti* may be regularly expected to turn up.

Rumour has it that, some few years ago, a certain professional collector transplanted our Burnet to other parts of the Forest. If this be so, I am unaware as to the amount of success that attended the experiment. It may, perhaps, be well to record it, in case some wandering entomologist stumbles across these "private" colonies.

Regarding insects of other orders, I fear I have little to record, but it may be worth mentioning that the pine sawfly (*Lophyrus pini*) produced an additional brood. This insect would seem to be generally double-brooded here, the first brood appearing in April and May, and the second in July and August. The larvæ resulting from the second brood, as a rule, remain in their cocoons until the following spring, when they pupate some fortnight or so before the imagines emerge. During last October, however, numbers of the imagines of both sexes might be beaten from *Pinus sylvestris*, even up to the end of the month.

In August Mr. W. J. Lucas was fortunate enough to capture several male and female specimens of the rare dragonfly, *Sympetrum fonscolombii*.

That weird-looking "beastie," *Centrotus cornutus*, turned up in greater numbers than I have ever known before, *Cixius pilosus* being also very common. The Typhlocybæ were not nearly so abundant as in 1910. Undoubtedly, the insects that were more noticed than any others in 1911 were the common wasps, *Vespa vulgaris* and *V. germanica*, which literally swarmed. A worker was observed on the wing as late as November 19th, while a queen, which had flown into a neighbouring cottage, was brought to me on December 30th. This abundance seems rather remarkable, as 1910 was particularly noticeable for the scarcity of wasps here, as in other places.

Brockenhurst: January 30th, 1912.

NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

Agrotis arenosa, sp. n.

Fore wings pale ochreous brown mottled with darker ochreous; antemedial line dusky, irregular, and indistinct; postmedial line indicated by brown dots on the veins, preceded and followed by dusky marks between the veins; blackish dots between the veins on termen; a dark brown quadrate spot representing the reniform stigma; fringes pale, traversed by a darker line. Hind wings fuscous, glossy, fringes pale. Under side whitish, ochreous tinged, discal area of fore wings suffused with blackish; all the wings have a black discal dot and a dusky, curved, postmedial line.

Expanse, 36 millim.

Collection number, 945.

A male specimen from Arizan (7500 ft.), September 11th, 1906.

Near *A. rubicilia*, Moore.

Epilecta flavilinea, sp. n.

Fore wings dark brown, thickly powdered with grey on basal and costal areas; antemedial and postmedial lines yellow, edged on each side with black, the former outwardly oblique and the latter almost parallel with termen; space between postmedial and the ochreous subterminal line rather darker brown; area beyond the subterminal line slightly tinged with reddish; black marks towards base of the wing, on the costa, and on each side of the orbicular; a short black dash from inner edge of subterminal line near costa. Hind wings yellow, termen bordered with blackish except towards tornus. Under surface of fore wings blackish, costa and terminal area yellow flecked with blackish; hind wings as above.

Expanse, ♂ 36 millim., ♀ 40 millim.

Collection number, 1685.

One example of each sex from Arizan (7500 ft.), September, 1908.

Allied to *E. accipiter*, Feld.

Hermonassa inconstans, sp. n.

♂. Fore wings ochreous brown, lightly freckled with brownish, outer third brown; subbasal line double, blackish, not continued to dorsum; antemedial line double, blackish, indented below costa; postmedial line double, blackish, wavy, curved beyond cell, indented below costa and above dorsum; subterminal line blackish, wavy; terminal dots black; reniform, orbicular, and claviform black, outlined in ochreous, reniform enclosing an ochreous line. Hind wings fuscous brown. Under side whitish suffused with fuscous, especially on fore wings; all the wings have blackish discal mark and postmedial line, the latter on hind wings indistinct towards dorsum.

Expanse, 28–32 millim.

Collection number, 946.

Two male specimens from Arizan (7500 ft.); one, the type, taken August 8th, 1908; the other captured September 21st, 1906. In the latter specimen the outer third of fore wings is concolorous with the rest of the wing, and the subterminal line is more distinct.

Allied to *H. incisa*, Moore, from Sikkim.

Hermonassa sinuosa, sp. n.

♂. Fore wings whitish, faintly suffused with pale brown, basal third greyish; basal line black, interrupted at median nervure, not continued to dorsum; antemedial line blackish, sinuous, followed by a black spot on the costa and a black sinus about middle; postmedial line blackish, wavy, excurved below costa, incurved above dorsum, preceded by a black spot on costa; subterminal line blackish, indistinct, originating in a large black spot on costa; reniform and orbicular paler than ground colour, outlined and centred with brownish. Hind wings fuscous, slightly paler towards base; a blackish discal dot and indications of a dusky postmedial line beyond. Fringes of the ground colour traversed by a pinkish brown line. Under side pale fuscous, brownish on costal area of hind wings; rather glossy; markings on fore wings indistinct; hind wings have a black discal mark and black postmedial line; the latter is sinuous and diffuse towards the dorsum.

♀. Similar to the male, but in addition to the other markings it has a blackish central line, which is bidentate towards costa.

Expanse, 30 millim.

Collection number, 1748.

One example of each sex from Rantaizan, May, 1906.

Allied to *Hermonassa* (*Graphiphora*) *pallidula*, Leech, from Western China.

Cirphis taiwana, sp. n.

♀. Fore wings pale ochreous brown, clouded and striated with reddish brown on the discal area; costa dotted with blackish; orbicular stigma brown, reniform blackish, both pale outlined, a whitish L-mark at lower end of reniform, and blackish diffuse spot beyond it; antemedial line blackish, with black dots upon it, outwardly oblique to just below vein two, thence inwardly oblique and indistinct to dorsum; postmedial line formed of black dots, which are connected by a wavy blackish line towards costa, almost parallel with termen, but the spot between veins one and two elongate placed inwards, and out of line with the others; fringes checkered with brown, preceded by black dots on termen. Hind wings dark fuscous, fringes pale ochreous brown; discoidal mark blackish. Under side pale ochreous brown, clouded with blackish on discal area of fore wings; all the wings have black discoidal spot and postmedial line, and black dots on termen.

Expanse, 42 millim.

Collection number, 146*a*.

Two female specimens from Rantaizan.

Near *C. goniosigma*, Hampson, from Ceylon; also *C. dharma*, Moore, from Sikkim.

Daseochæta pulchra, sp. n.

♂. Fore wings green, longitudinally streaked with brown at the base and beyond middle of the wing; basal and antemedial lines black, both interrupted below costa, the latter expanded on dorsal area, and outwardly edged with white; postmedial line black, interrupted below costa and again by the lower brown streak, edged with white towards dorsum; subterminal line whitish sinuous, inwardly edged with blackish; costa dotted with black, a black mark between the stigmata, and two smaller ones below; fringes green checkered with darker, black dots at their base and tips. Hind wings pale fuscous, discoidal mark and postmedial line dusky; fringes pale greenish. Under side pale greenish; basal three-fourths of fore wings suffused with blackish; a blackish spot on middle of costa and a blackish clouded postmedial line on all the wings; a black dot in the cell, and a larger one at end of cell of hind wings.

Expanse, 32 millim.

Collection number, 924.

A male specimen from Arizan, September 25th, 1906.

Near *D. discibrunnea*, Moore.

Perigea albigutta, sp. n.

♀. Fore wings dark chocolate-brown, costa dotted with white; antemedial and postmedial lines indicated by white points, the latter irregular, double; subterminal line represented by white dots, three above the middle and one near dorsum larger than the others; a series of white dots on termen; reniform and orbicular stigmata represented by clusters of white dots; fringes marked with white at ends of the veins. Hind wings fuscous, inclining to black on outer area. Under side whitish, freckled and suffused with fuscous; blackish discoidal mark and postmedial line on all the wings; outer fourth blackish, traversed by a pale subterminal line on fore wings.

Expanse, 39 millim.

Collection number, 942.

A female specimen from Kanshirei (1000 ft.), July 28th, 1906.

Near *P. stellata*, Moore.

BUTTERFLIES AT DIGNE.

By Gerard H. Gurney, F.E.S.

(Concluded from p. 97.)

Melitæa aurinia var. *provincialis*.—*M. phœbe*. Not very common; those I took all tended to var. *cinxioides*.—*M. didyma*.—*M. cinxia*. A fresh brood began to appear about July 20th.—*M. deione*. A very few worn ones were noted.—*M. parthenie*. I took a magnificent aberration of this species on July 18th; in Oberthür's 'Lépidoptérologie Comparée,' it is figured as ab. *rhoio*; on the upper side there are no black markings on the fore wings at all, except the outer margin and a suffused patch at the base. On the lower wings all orange colouring is absent, leaving the wings entirely brown: the under sides of the hind wings are pure white, except a greenish brown patch at the base containing a large black discoidal spot.—*M. athalia*.

Pyrameis cardui.—*P. atalanta*.—*Euvanessa antiopa*. Only one or two seen.—*Vanessa io*.—*Aglais urticæ*.—*Eugonia polychloros*.—*Polygonia egea*. Scarce; not more than two or three seen.—*P. c-album*.

Limenitis camilla. Small males of a second brood were common.

Parage mæra.—*P. megæra*.—*P. egeria*.

Satyrus hermione. Very abundant, and in magnificent condition on July 18th; the females are very large.—*S. alcyone*. This species is perfectly distinct from *hermione* at Digne, being found at a higher level and always resting on the ground, never on trees; it is very constant in size, it also emerges later than *hermione*: on July 23rd, in places where *hermione* was beginning to get much worn, *alcyone* was quite fresh.—*S. circe*. Plentiful in orchards and hayfields, and quite fresh on July 18th; very large and fine, some of the females being enormous; many have a second spot on the fore wing.—*S. cordula*. Abundant everywhere, but beginning to go over by July 21st. The females show considerable variation in the colouring of the light band on the upper side of the hind wing; in some specimens it is very light orange brown, in others there is hardly any trace of a band, the whole wing being a uniform dark brown; all the specimens are extremely dark compared with those from the Rhone Valley.—*S. actæa.* In beautifully fresh condition and very common in places, but not found everywhere round Digne; it did not emerge until July 22nd.

Ennodia dryas. I only took this species on one or two banks on the road to Les Dourbs; the females are very large.

Hipparchia statilinus. Just beginning to emerge as I left.—*H. fidia.* This fine species was common after July 19th, and amongst the series of twenty which I took are some magnificent specimens; it was very fond of settling on the white flowers of the wild clematis and was then much more easily captured than when sitting on rocks or on the road.—*H. briseis.* Emerging on July 18th, this species quickly became very common on dry, stony ground, though I appeared to take the great big females more often flying along the edges of hayfields.—*H. semele.* Very common, but not an exceptionally fine form.—*H. arethusa* var. *dentata.* Males were common on August 1st, and all I took were of this variety. I was too early for the females.

Epinephele ianira.—*E. lycaon.* Very common everywhere; many of the males have a second spot towards the anal angle, upper side of the fore wing.—*E. tithonus.* Abundant; the females were large and brilliantly coloured.

Cœnonympha arcania. I found a few fresh ones, presumably of a second brood, considerably smaller than those I had previously taken at Digne in June.—*C. dorus.* Extremely abundant everywhere, quite fresh and showing a good deal of variation.—*C. pamphilus.*

Erebia melampus. By no means uncommon high up on the Dourbs on July 31st, but a good deal worn.—*E. stygne.* Near Digne and also on the Dourbs.—*E. scipio.* I found *scipio* quite common on the one slope on which this species flies on the Dourbs on July 31st, but on this date no females were seen, they were all males and generally quite fresh. In the hot sun they fly very swiftly up and down the flower-covered precipice, on which, owing to its steepness and the loose rolling stones, it is a very difficult matter to catch them; directly the sun becomes overcast they cease flying and drop down amongst the stones, often with outspread wings. I strongly suspect that if properly searched for this species would be found on other parts of the Dourbs. The series of twenty-two which I took show a good deal of variation in the number of spots on upper side of the hind wing; three appears to be the usual number, but I took specimens with two and one spot on each wing, and eight of my series have no spots whatever; on the upper wings the proportion of insects having two spots and four seems to be equally divided.—*E. ligea.* Rather plentiful in the beech forest half-way up the Dourbs.—*E. neoridas.* I saw the first on July 25th, and it was beginning to get very common when I left Digne on August 1st.—*E. goante.* Common in one place on the Dourbs, just above the slope on which I took *scipio*, they were quite fresh.—*E. tyndarus* var. *cassiodes.* Flying with the last species, but rather more widely distributed. It was common and in good condition; all I took were of this variety.

Melanargia galathea.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief Gervase F. Mathew, R.N., F.E.S., &c.

May was mainly a fine bright month, and some of the days were very hot; there was scarcely any rain, except a few showers on the 2nd and 3rd, rather wet on the 14th, and a shower or two on the 30th. From the 18th to the 21st the weather was very dull, with keen north-easterly wind. There was a good deal of wind during the month. On the 1st *Catoptria ulicetana* was noticed flying about furze-bushes, in the hot sunshine, in great numbers; and at night some larvæ of *Triphæna orbona*, *T. ianthina*, *Noctua triangulum* and *Boarmia repandata*, were beaten from hawthorn—mostly full grown. The first *P. napi* was noticed on the 3rd, and a beautiful red variety of *Tæniocampa gracilis* was bred from New Forest larvæ. On the 4th a boy brought me a male *Dicranura vinula*, which had been attracted by the electric lights at Parkeston, and in the evening I visited the woods and beat some larvæ of *T. fimbria*, *N. baja*, &c.; it was a warm night with gentle south-westerly breeze, but I did not see a moth on the wing. The first *Pieris brassicæ* was observed on the 5th, two *Cyaniris argiolus* were taken, and *Asthena luteata* bred. On the 8th *Amphidasys betularia* ab. *doubledayaria* was reared from the only larva taken last year, and *Fumea radiella*, male, was captured flying among coarse grass on the sea-bank. The 9th was gloriously bright and warm, and in the evening I tried beating hedges near the salterns and obtained a few larvæ of *Lasiocampa quercus*, *T. interjecta*, *N. augur*, *Crocallis elinguaria*, &c. It was a windy night, with a bright moon and heavy dew, and the only moths noticed were a few *E. pumilata* and one *Xanthorrhœ fluctuata*. *Euchloë cardamines* was bred on the 10th, and on this day I saw the first swifts. Four *Eupithecia dodoneata* were taken on trunks of *Ilex*, and one *Lycia hirtaria* (which is a rare moth in this neighbourhood) from a paling. On the 12th, a bright morning, I took a female *S. carpini*, bred on the 11th, placed her on a hedge in a likely-looking spot, and waited for nearly two hours, but no male was attracted—perhaps they were not yet out. The 13th was fine and hot, with thunder-clouds about, and distant thunder. I went to the woods in the forenoon; *A. cardamines* was just appearing, there were plenty of *P. rapæ* and *P. napi*, and from the bushes I beat *Numeria pulveraria*, *L. petraria*, *V. maculata*, *C. ferrugata*, *C. unidentaria*, *Phoxopteryx lundana* and *P. lætana*, and one small larva of *Limenitis sibylla* was noticed. Before I left home in the morning I placed the *S. carpini* female, bred on the 11th, in a box with lid slightly open, in my garden, and when I returned at 1 p.m.

she was still resting quietly, but at 2.30 I noticed she was "calling." I then went out for a couple of hours, and when I returned at 4.30 found her wedded to a very fine male; at 5.15 the pairing was over, and I killed the male. At 7.30 I found the female had laid a large number of eggs. On the 15th several larvæ of *Pseudoterpna pruinata* (*cytisaria*), nearly full-grown, was beaten from broom, and plenty of larvæ of *Chesias spartiata* were seen. In the evening, which was warm and muggy, *Perizoma affinitata* was netted, and four larvæ of *T. interjecta* were picked off nettles. A large female *Smerinthus populi* was noticed, just emerged, on a poplar in the garden. 16th. Many *N. pulveraria* bred about this time. The 17th was fine and bright, with a keen north-easterly breeze, and I went to the distant woods, where I found *Argynnis euphrosyne* just coming out, and captured and examined sixteen of them, hoping for varieties, but they were all typical, fifteen males and one female. One *Nemeobius lucina* was seen; this is getting very scarce, and I fear will soon cease to exist in this locality. Beating was very unproductive; I think the cold wind kept the insects from moving. I only saw one *Lomaspilis marginata*, one *Acidalia remutata*, and three *Lobophora hexapterata*; the latter were sitting on tree-trunks near aspens; they are very crafty, and often dodge behind the trees when one tries to box or net them. The 18th was cool and overcast, with a north-easterly wind. I tried sweeping nettles, &c., after dark, and obtained nine larvæ of *T. interjecta* and several *Leucania lithargyria*, &c.; half-grown larvæ of *Cosmotriche potatoria* were numerous, and full-grown *Hypena proboscidalis* abundant. The 22nd being bright and warm, I went to the woods to beat for larvæ, but found them very scarce indeed, and only saw a few each of *P. pilosaria*, *H. defoliaria*, &c., species which ought to have been swarming now. On honeysuckle I noticed half a dozen larvæ of *L. sibylla* and two of *P. syringaria*. *Pararge megæra* was seen for the first time. This butterfly had almost disappeared from this neighbourhood, but last autumn I turned down about sixty, which I bred from ova received from the South of Ireland. The 23rd was fine and warm—*C. pamphilus* was out in large numbers, and *H. arbuti* and *A. ochrearia* were flying over rough ground among rushes and mouse-ear. The 24th was another warm day, and in the evening I sugared in the woods; it was (apparently) a very favourable night, but only two moths visited the bait: one *Palimpsestis or*, and one hybernated *Scoliopteryx libatrix*. Geometræ and Tortrices were flying in some numbers just before sunset, but the flight did not last, as a slight dew and cool north-westerly wind appeared to send them into shelter.

(To be continued.)

NOTES AND OBSERVATIONS.

Depressaria putridella in the Harwich District. — Many years ago I used to notice towards the end of May and beginning of June that the young plants of the very local hog's-fennel (*Peucedanum officinale*), which is not uncommon in certain localities in this neighbourhood, were infested by the larvæ of some species of *Depressaria*, but, not being very keen about the Tineinæ, I did not pay much attention to them, though I know it now and then occurred to me that, as the plant was so local the chances were that these larvæ might also be something of a rarity; and so the years rolled on until 1909, when Mr. Sich's record of the discovery of *D. putridella* in Kent made me think that the larvæ I had noticed so often on hog's-fennel and treated of so little account might probably be that species; and so the next year (1910), the larvæ being as plentiful as usual, I took some of them with their food-plant, and placed it in a wide-mouthed bottle in a large flower-pot, with muslin hood over, and in a few weeks bred a couple of dozen *D. putridella*.—Gervase F. Mathew; Dovercourt, March 8th, 1912.

Cœnonympha typhon. — I shall be very much obliged if any collector can furnish me with two pairs of Irish *Cœnonympha typhon* in first-rate condition. They are required for figuring in a future number of M. C. Oberthür's 'Lépidoptérologie Comparée,' to which I am contributing a short account of the British and Irish forms. Also wanted "furthest north" Scots forms. I shall be pleased to exchange.—H. Rowland-Brown; Harrow Weald.

Early Emergences. — *Phigalia pedaria* (*pilosaria*) on lamps in suburbs, January 1st, 2nd, and 5th. *A. flavicornis* on palings at Sutton Park, March 1st, and *H. progemmaria* (type and melanic), March 5th. Out of three hundred bred pupæ of *Odontopera bidentata*, although kept in cold room till January 1st, and since then out of doors, forty-three (type and black forms) have emerged up to date. The first one emerged December 22nd, eighteen in January, nineteen in February. Thermometer in breeding-cage, 33° F. at moment of emergence of several. Three pairings have been obtained, and ova deposited.—W. Bowater; Russell Road, Moseley, Birmingham, March 11th, 1912.

Nyssia hispidaria in Norfolk. — I captured, on Wednesday, February 14th, in Northrepps Woods, near Cromer, one male *Nyssia hispidaria* resting on an oak-trunk by day.—A. C. Morris; Roughton Rectory, Norwich, February 23rd, 1912.

Hesperia onopordi in the Pyrenees. — While staying at Gavarnie last July I took a fine series of *H. alveus*, which was very common there. A short time ago, when taking the specimens off the setting-boards, I found among them three *H. onopordi*, all males, and in perfect condition. Two were captured in the Val d'Ossue, one on July 16th, the other on the 20th, the third coming from the Val d'Astazou on the 14th. Mr. Rowland-Brown informs me that

M. Rondou, of Gédre, has recorded Gar du Pau as the only locality in the Pyrenees for *H. onopordi* so far. Gavarnie is, of course, very much higher. — B. C. S. Warren; Innis, Claygate, March 21st, 1912.

Note on Aporophyla nigra. — Tutt's 'Lepidopterist's Handbook' gives ova of *Aporophyla nigra* as hatching six weeks after deposition (*i. e.* end of October), and elsewhere I have seen the larval period described as extending from October to May. That such is not always the case I am in a position to prove. Two batches of ova were obtained from female *A. nigra*, taken on sugar about the middle of September last year. The egg when laid was a uniform orange-yellow. At the time they ought (?) to have hatched, the apical half was marbled with a mixture of reddish and whitish, the basal half still keeping the original tint. Later, about Christmas, the reddish marbling had extended over the whole surface of the egg. A fortnight ago I brought them indoors on account of the fungoid growth which had attacked the damp cardboard pill-box, and which I feared might eventually kill the ova. On examining them I found they had assumed the dark slaty tint of eggs about to hatch. Kept in a cold upstairs room, they began to hatch on February 14th, and had all left the egg by the 17th. The greyish, bristly young larvæ refused dock, plantain, dandelion, and a coarse-leaved grass which grows in their locality, and which I had suspected would prove to be their true food, but took readily the hair-grass (*Aira cæspitosa*), which also thrives on our upland limestone pastures. They are growing somewhat slowly, but seem quite healthy. Though now two weeks old, they have not lost their early "looping" habit, and when resting on the grass-stems they frequently assume a striking *Sphinx*-like attitude. The ground colour of the body is now a deep grass-green, and they have lost that bristly appearance which characterized the newly hatched larvæ.— Frank Litllewood; 10, Aynam Road, Kendal.

Pyrameis atalanta in Early Spring.—Whether *P. atalanta* does or does not hybernate in this country I do not know, but it may be of interest to note that this morning (March 24th) I saw a specimen flying in a ride of Iron Hill Enclosure near here. I watched the insect for some ten minutes or so, and several times it settled on the fallen leaves within a yard or two of me. It was in good condition but perhaps rather faded. I may mention that I noticed a good many *P. atalanta* in the neighbourhood last autumn.—G. T. Lyle; Bank House, Brockenhurst.

The Entomological Club. — Meetings were held on February 27th, 1912, at 58, Kensington Mansions, South Kensington, Mr. Horace St. John K. Donisthorpe in the chair; and on March 12th, 1912, at Wellfield, 4, Lingards Road, Lewisham, Mr. Robert Adkin in the chair. At the former meeting Mr. Alfred Sich was elected a Member of the Club, and Dr. Malcolm Burr an Honorary Member. At the latter meeting Mr. J. E. Collin was elected an Honorary Member of the Club.—Richard South, *Hon. Sec.*

SOCIETIES.

The South London Entomological and Natural History Society.—*Annual General Meeting.—January 25th*, 1912.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Reports of the Council and Officers for the past year were received and adopted. The following is the list of Council and Officers elected for the ensuing year:—President: A. E. Tonge, F.E.S.; Vice-Presidents: W. J. Kaye, F.E.S., and B. H. Smith, B.A., F.E.S.; Treasurer: T. W. Hall, F.E.S.; Librarian: A. W. Dods; Curator: W. West (Greenwich); Hon. Secretaries: Stanley Edwards, F.L.S., F.Z.S., F.E.S., and H. J. Turner, F.E.S.; Council: C. W. Colthrup, F. W. Cowham, A. E. Gibbs, F.L.S., F.E.S., R. A. R. Priske, F.E.S., A. Russell, F.E.S., A. Sich, F.E.S., and E. Step, F.L.S.—Mr. W. J. Kaye read the Annual Address.—Votes of thanks were passed to the Treasurer, Secretaries, and other officers.—*Ordinary Meeting.*—Mr. A. E. Tonge, F.E.S., President, took the chair.—Mr. A. C. Morris, of Upper Norwood, and Mr. F. W. Frohawk, of Wallington, were elected members.—Mr. Edwards exhibited the so-called "silver fish," *Lepisma saccharina.*—Mr. Main, a narcissus bulb, sent him by Mr. Winkworth, which had been attacked by the larva of the Dipteron, *Merodon equestris*, which was often extremely injurious in nurseries. Mr. Adkin, a *Tinea pallescentella* taken on Christmas Day, apparently just emerged.—Mr. Moore, a number of butterflies from the interior of Borneo, including *Papilio evemon* var. *P. itamputi*, *Terias gradiens*, *Hestia iogani* var. *virgo*, *Danisepa lowii*, and *Terias tilaha.* They were sent home to him packed in fragments of the flannel shirt of his friend who collected them, a successful method of combatting the excessive superabundance of moisture in the atmosphere of the locality.—Hy. J. Turner, *Hon. Report. Sec.*

Lancashire and Cheshire Entomological Society.—The fourth meeting of the session was held in the Royal Institution, Colquitt Street, Liverpool, on January 15th, 1912.—A large number of interesting lantern slides were exhibited by Dr. Cotton, Dr. Tinne, and Mr. O. Whittaker. Dr. Tinne's slides included many beautiful coloured examples taken by the Lumière and other colour processes.—Mr. Mansbridge exhibited a series of *Polia chi*, showing the usual range of melanic variation, from the Huddersfield district, and, also, on behalf of Mr. A. W. Boyd, a case of Micro-Lepidoptera from various localities in Cheshire, among them being *Mixodia schulziana*, *Sciaphila hybridana*, *Sophronia parenthesella*, *Chelaria hubnerella*, *Argyresthia pygmæella*, *Peronea comariana*, *&c.*—Oscar Whittaker and Wm. Mansbridge, *Hon. Secs.*

OBITUARY.

Samuel James Capper, F.E.S., F.L.S., &c.

Mr. Capper, of Hazle View, Huyton Park, Huyton, whose death we announced in our February issue, was a son of Joseph and Mary

Capper (*née* Camthorne), members of the Society of Friends, and was born at Highbury Place, London, N., April 28th, 1825. The family pedigree dates as far back as 1590 to a William Capper, copyholder, who lived near Rugeley, Staffordshire, and who died February 2nd of that year. The earliest mention of the family becoming members of the Society of Friends is found in a record of the marriage of Jasper Capper to Anne, daughter of John Fry, on April 21st, 1778.

From early childhood Mr. Capper evinced keen interest in Natural History objects, and when about twelve years old he was sent to a school at Epping, where his taste for Nature Study was greatly encouraged and developed. On half-holidays the boys were taken to the Forest, and permitted to roam therein at their leisure until a bugle-call warned them to reassemble. Opportunity was thus afforded, to those so inclined, to collect specimens, or in other ways attain knowledge of the fauna and flora of the district.

Mr. Capper's interest was chiefly centred in the Lepidoptera, and he, with the help of one or two of his schoolmates, made a very fair collection of the moths and butterflies occurring in Epping Forest. He also received valuable help from the brothers Doubleday, who were always happy in rendering assistance to young entomologists, instructing them in the art of setting and preserving insects, and solving difficulties connected with the identification of captures.

In the year 1846 Mr. Capper settled in Liverpool, and soon made the acquaintance of Messrs. Nicholas and Benjamin Cooke, C. S. Gregson, N. Greening, and other leading entomologists of that district and period. About 1866 he became known to the late Mr. Alfred Owen, with whom he afterwards made collecting expeditions to various districts, including the New Forest and Penmaenmawr. In the latter he secured, among other species then considered rare, *Acidalia contiguaria** during July, 1874, but met with the unfortunate accident which resulted in his being permanently lame, and therefore unable to again engage in the pleasure of active field work.

His connection with the Lancashire and Cheshire Entomological Society has been a long one. The preliminary meeting was held at the residence of the late Mr. N. Cooke, at which Mr. Capper, who did not attend, was elected President, and this office he held for thirty-five years. The first official meeting seems to have been held at Huyton Park on March 26th, 1877.

Apart from the many excellent addresses to the members of the Society, over the meetings of which he so long and so ably presided, his published writings on entomological subjects are rather few in number. An article entitled "Educational Collections" (Entom. x. 40–42) bears evidence that, although chiefly interested in the Lepidoptera, all orders of the Insecta received a share of his attention.

For many years Mr. Capper was a partner in the firm of Thompson and Capper, manufacturing chemists, Liverpool, and, although he continued association with it, he had not taken an active part in the business during the past fifteen years or so.

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* A Geometrid moth known under three English names—"Weaver's Wave," "Greening's Pug," and "Capper's Acidalia."

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BRITISH ODONATA IN 1911.

BY W. J. LUCAS, B.A., F.E.S.

So abnormal a summer as that of 1911 could not fail to provide points of interest to those who concern themselves with British dragonflies. It may be that 1912 and 1913 will witness a scarcity of some species, owing to the drying up of their breeding-grounds, although it is quite possible that the race has already provided against such a contingency. It is to be hoped that observation in connection with this subject will be made by those who work amongst the Odonata, or those who, though not specially interested in these insects, are favourably situated for making such observations. It seems likely that one immediate result of the dry hot season was the migratory impulse that appeared to be at work amongst the dragonflies, which will be referred to later.

Personally, the first date on which a dragonfly came under my notice was May 7th, when one or two Agrionids were seen near Oxshott, Surrey. They were not captured, but no doubt were examples of *Pyrrhosoma nymphula*. On May 26th Mr. B. S. Williams sent me four specimens, two males and two females, of *Libellula depressa* (the males being without a trace of blue colouring), which he had captured at Finchley, where he had never seen the species before. Mr. H. W. Andrews showed me *L. quadrimaculata* and *P. nymphula*, taken during a visit to Glengarriff, co. Cork, from May 21st–26th. On May 28th Mr. N. Fenwick, Jun., found large numbers of *Cordulia ænea* out at the Black Pond, in Surrey. He took one male and three females, and could have caught many more. *L. quadrimaculata* was out in force, as also were *P. nymphula* and *Enallagma cyathigerum*, but he saw no other species. On June 4th dragonflies were very numerous at this pond, and, in addition to those already mentioned, a summer species, *Pyrrhosoma tenellum*, was on the wing. A nymph-skin (species undetermined) was on this occasion taken from the trunk of a Scotch fir some ten or twelve yards from the pond and more than six feet above the ground. The next day dragonflies were found to be plentiful at a small pond between the River Wey and the large pond, Boldermere, facing the Hut Hotel, near Wisley, in Surrey. These were *L. quadrimaculata*, *P. nymphula*, and *Agrion puella*, while a larger one seen appeared to be *Brachytron pratense*.

Writing on June 16th, Mr. G. T. Porritt told me that on June 15th Dr. Corbett and himself visited the locality near Askern, in Yorkshire, where the former took *Libellula fulva* two years previously, and Mosley took it twenty or more years ago. They were delighted to find it in abundance, flying all about the place. Mr. Porritt had never seen it so plentiful, even in the Norfolk Broads. The males were in adult colouring, and there were plenty of females, which are usually scarcer in the Broads. Many were paired. Altogether it was very satisfactory to find the species thus well established in so northern a locality.

On July 2nd, near Oxshott and Claygate, in Surrey, dragonflies were not so much in evidence as they were on June 4th. One or two examples of *L. depressa* haunting a hedgerow were particularly agile, and after receiving a lengthy attention remained uncaptured, although, as usual, they were very loth to forsake their chosen resort.

During the first few days of August, Mr. K. J. Morton saw *Sympetrum striolatum*, *Lestes sponsa*, *Ischnura elegans*, and *Agrion pulchellum* at Llanfaethlu, in the Island of Anglesey.

In the New Forest during August dragonflies were plentiful enough, being apparently but little affected by the dry weather. It would seem that some species were over earlier than usual, for I did not meet with a single example of either *Ischnura pumilio* or *Agrion mercuriale*. On August 15th a nymph-skin of *Cordulegaster annulatus* was found some two or three feet up a tree-trunk several yards from the bank of Beaulieu River, in which of course it had passed the previous part of its existence. What object could the nymph have had in crawling so far? On August 27th Mr. Lyle and myself searched for nymph-skins under bridges at Queen's Bower, the lowness of the water allowing us to do so without difficulty. Under Bolderford Bridge we found three *C. annulatus*, two *Calopteryx virgo*, one *S. striolatum* (probably), and one *Platycnemis pennipes* (possibly). All had taken up a position beneath a horizontal beam, and so had their dorsal surface downwards. Under the bridge near Hurst Hill were one *C. annulatus* and one *C. virgo*, and these were similarly suspended. It is strange that all were so placed, especially as there was no actual necessity for it, since in my own experience this is an unusual or even unique position to assume for emergence.

On August 4th, at a rather large shallow pond in what is perhaps an old marl-pit on Beaulieu Heath, in the New Forest, some dragonflies with red bodies were on the wing. At first I took them for the common *S. striolatum*, till their manner of flight and strikingly brilliant tint caught my attention. The former resembled that of *Sympetrum flaveolum* and *S. sanguineum* as I had been accustomed to it at Wisley Ponds, in Surrey. After considerable difficulty three were captured, and I found that I had added a new species to my British collection and at the same time to the New Forest list (*vide antea*, vol. xliv. p. 267). The species was in fact *S. fonscolombii*, which almost certainly is always a migrant to our shores. All were males, and another seen was apparently a male also. On August 7th I revisited the pond and found the species still present. At least one female which looked like a *Sympetrum* was seen, but it was not captured. As, however, I took a male *S. striolatum*, the female may have belonged to that species, or it may even have been an *Orthetrum*, as *O. cærulescens* was common at the spot.

On August 8th I made a third excursion to the pond, and this time secured a female *S. fonscolombii*. The fresh condition of the species and the capture of the female raised some doubt in my mind as to whether the dragonflies could be migrants after all, an opinion which Mr. C. A. Briggs shared with me, in consequence of the lateness of the date. When hovering on the wing in the brilliant sunshine their bodies glow with a rich soft scarlet tint, which unfortunately becomes dark and dull as they dry after death. The female, which was in perfect condition, looked very pale on the wing. On August 24th I again visited the spot, but it began to rain as soon as I arrived. The next day, however, I tried again, and found specimens numerous, but their restless habits and the rather high wind made it difficult to catch them. As *S. striolatum* was on the wing also, it was difficult to tell whether any females of *S. fonscolombii* were present; but one very pale specimen belonged, I think, to the scarcer species. Unfortunately I could not effect a capture. The insects were not so fresh now, but the crimson colouring was as rich as ever. On August 29th I visited the pond for the last time. Males still seemed fairly numerous, but they were as usual very restless, and I captured but one.

From the New Forest we must now turn our attention to Scotland. Mr. W. Evans tells us in the 'Scottish Naturalist' (No. 1, p. 12, January, 1912) of his capture of a female *S. fonscolombii* on August 17th in the Isle of May at the mouth of the Firth of Forth. He afterwards heard from Mr. P. H. Grimshaw that another female had been caught by a boy in Edinburgh on August 11th. Further, as he was examining a box of insects for Mr. J. W. Bowhill, he found amongst them a fine male of the same species which had been taken on July 30th near Aberlady, where others were seen at the same time.

Nor is this all. In the autumn Lieut.-Col. C. G. Nurse sent me some dragonflies for identification, and amongst them were two males of *S. fonscolombii*, one taken at Ampton, in West

Suffolk, on August 17th, and the other at Towyn, in Merionethshire, also in August, the latter by Rev. E. J. Nurse (one of two captured). In connection with the Welsh specimens it is worthy of note that on June 2nd a swarm of dragonflies was seen flying *east* near Aberdovey. The flight was noticed by several people at Towyn and Aberdovey, and it was so large as to be mentioned in one of the local papers. There is nothing, however, to show that the two Welsh specimens of *S. fonscolombii* belonged to this swarm. If those entomologists who took red-bodied Sympetra in Britain during last summer were to critically examine their captures, it is quite likely that other examples of *S. fonscolombii* might be discovered. It should also be mentioned that Mr. Watts took another dragonfly, which is usually considered a migrant (*S flaveolum*, male), at Wisley Pond, Surrey, on August 18th; and that Mr. H. Campion took two more males at the same place a few days later.

Previous records of *S. fonscolombii* captured in Britain are: (1) a female in Stephen's collection *supposed* to have been taken near London; (2) a male captured in 1881 at Deal, now, I believe, in the Dover Museum; (3) seventeen males taken by Mr. C. A. Briggs at Ockham Common, Surrey, in June, 1892; (4) a female taken in Cornwall by Mr. Boyd in June, 1903; (5) two males taken June 24th, 1908, by Mr. E. R. Speyer near Shenley, Herts; (6) a female taken by Mr. Speyer at Aldenham Reservoir on July 29th, 1908. A male from the Devignes' collection, now in the McLachlan collection, has no indication of the locality whence it came, and therefore cannot with certainty be set down as British.

(To be concluded.)

EREBIA MANTO AND ITS VARIETIES ABOVE CHAMPÉRY.

By the Rev. F. E. Lowe, M.A., F.E.S.

Drawn by reports which I had heard of Champéry, above Monthey, as a locality for many of the Erebias, I spent a few days there last year. We put up at the Hôtel Dent du Midi on July 26th, and remained until August 1st. This was of course late in the season and naturally butterflies were on the wane. The slopes of the Dent du Midi and of the Dent Blanche, though so near to the eye, are rather fatiguing to reach. As the river runs between, it is necessary to descend from Champéry to the bridge before beginning to make the ascent. I paid two visits to the little shanty of Anthémoz, whence I worked along the rough ground diagonally and upwards for about another two hundred feet. Here I was among the Erebias that I had come after. *E. gorge, epiphron, pharte,* and *pronoe* var. *pitho* had probably been common, but were now represented by a few very worn specimens.

There remained, however, one species, *E. manto,* which was present in abundance, and for the most part in first-rate order, and this presented a range of variety sufficient to make interesting collecting. The males certainly were not always fit for the cabinet, but the females, which were nearly equally common, were generally in splendid condition, and it was in them that interest centred.

Here *manto* seems to offer itself in almost every variety, and the type-form was unusual. Var. or ab. *cæcilia* was taken occasionally, but always for some obscure reason too battered to afford specimens. Not uncommon, too, was a very small form, in size qualifying for ab. *pyrrhula,* Frey., but still retaining the eye-spots too distinctly, and too much trace of the russet surroundings, to quite justify the title. Very interesting, however, was a form (almost the commonest) which I can only consider to be var. *vogesiaca,* Christ, defined by Staudinger in his Catalogue, as females, *without the basal spots,* on under side of hind wings, but otherwise as type *manto.* This striking form both the above authority and Rühl seem to regard as restricted to the Vosges, and it was therefore a pleasant surprise; nor is it mentioned in Wheeler's 'Butterflies of Switzerland.' But this was by no means the extreme of variation presented by the Anthémoz race. Hardly less common was a female form *entirely* without markings on the *under side.* At first I thought that this was a hitherto unnoticed variety, and had distinguished it in my cabinet as ab. *indigens,* on my own responsibility. But on further examination of Staudinger's Catalogue I found in the first paragraph, under the type heading *manto,* "ab. female *trajanus,* Hormuz. Soc. Ent. ix. 1895, p. 161 (al post. subt. basi immaculata, maculis exterior. fere æqualibus)." I have not the opportunity of searching the pages of the 'Societas Entomologica' for a description of *trajanus* and comparing it with my specimens from Champéry, and can therefore only surmise that my captures fall under this form. Again, var. *vogesiaca,* as described more at length in Rühl, is stated to be larger than type, with the markings of the fore wings yellow and broader, and seldom containing the black spots. Mine, from the Champéry locality, are only of average size, with dull but rust-coloured small patches on the upper side of fore wings with fairly distinct eye-spots; and are therefore to be regarded as a separate variety, or a transition to var. *vogesiaca.*

In any case I had reason to be much pleased with the result of my visit to this locality, as it afforded two forms for Switzerland (new to me) after fifteen consecutive years' pursuit of butterflies in that land of Erebias. The only other butterflies of interest were the extraordinary number of *Argiades corydon* and *Polyommatus damon* by the sides of the railway between Monthey and Champéry, the former exceptionally large. It was just above the little station of Trois Torrents that they appeared to fill the air, fluttering even into the carriage windows. From this their number gradually declined till after leaving the station of Champéry, both became decidedly scarce. Perhaps at the slightly higher altitude they had not yet fully emerged, and those taken were not large specimens.

St. Stephen's Vicarage, Guernsey.

NOTES ON *ANOSIA PLEXIPPUS.*

By the Rev. James Aiken, M.A.

An interesting article on *Anosia plexippus* (life-history) appears in your December number (Entom. xliv. pp. 377–382) from the pen of Mr. Frohawk. The following extracts from my note-book may be of interest in so far as the observations were made on the insect in its own natural conditions.

In British Guiana the food-plant is *Asclepias currassavica* exclusively, so far as I have observed. This butterfly invariably lays its eggs singly on the under side of the leaf. Alighting on the apical quarter it arches the abdomen under the leaf and deposits the egg generally about the middle, then flits away in search of another plant. The egg matures in two to three days, and the larva grows rapidly. Some eggs which I took on March 18th hatched out the same day. On March 24th the caterpillars were about 1½ in. in length, and one pupated on 26th. Another attached itself to top of breeding-cage, and was attacked by a third smaller caterpillar. The pupating larva shook himself and wriggled, but the cannibal continued his attack until he had eaten a deepish groove in the mid-dorsal region of his mate, about 20 millim. long and 2 millim. broad. I put fresh leaves in the box when I observed the attack, but the cannibal did not leave his prey until the death of the resting larva the following morning. This larva pupated on April 1st.

The pupal stage lasted on the average ten days for these and for some nearly full-grown wild caterpillars taken on October 30th, 1910, at Mara, on the Berbice Rio. These pupated between November 2nd and 3rd, and the imagines emerged on 12th and 13th.

One of these pupæ attached itself in quite a peculiar way to a leaf-stalk by grasping the thin twig in a groove of the abdomen formed between the sixth and seventh segments, and so hung partially curled round the stalk. The imago successfully extricated itself on November 13th.

The colour of the larva is very nearly the same as that of the green pod of the food-plant, *A. currassavica*, and is doubtless protective. Certainly they are very difficult to detect as they hang on the growing plant.

St. Saviour's Parish, Berbice, British Guiana.

NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

Boralia irrorata, sp. n.

♂. Fore wings pale grey-brown, faintly tinged with pink, finely irrorated with black; a small black discoidal spot; postmedial line represented by black dots on the veins, excurved from costa to vein six, thence almost parallel with termen; black dots between the veins on termen; fringes whitish at tips. Hind wings whitish, tinged with fuscous, except termen and fringes. Under side whitish; fore wings suffused with brownish on costal area and clouded with blackish on the disc; costal area of hind wings powdered with brownish.

Expanse, 35 millim.

Collection number, 1485.

A male specimen from Kanshirei, April 27th, 1908.

Cirphis subdecora, sp. n.

♂. Fore wings pale brown, faintly pink-tinged, costa broadly whitish; a broad, darker, shade-like streak from base of the wing to apex, where it meets a short, oblique, pale streak; veins whitish, with dark longitudinal lines between them on outer half of the wings; dorsal area slightly darker; postmedial line indicated by black dots chiefly towards the costa; terminal line blackish, with black dots upon it between the veins. Hind wings fuscous, whitish towards the base. Under side silvery except at base and on costa of the fore wings, and the base and dorsum of hind wings.

Expanse, 38 millim.

Collection number, 139.

A male specimen from Koannania, June 22nd, 1906.

Trigonophora clava, sp. n.

♀. Fore wings pale brown, slightly pinkish tinged, patched with darker brown on dorsum towards base, on median area except towards costa, and on the terminal area below vein six; the dorsal patch triangular, its base black; reniform and orbicular of the ground colour, clouded with darker, outlined in black, lower extremities united; claviform whitish, outlined in black; subbasal line black, double, angled below costa, not reaching dorsum; antemedial line black, double, curved; postmedial line black, double, oblique, elbowed between veins four and five, terminating on dorsum towards the antemedial; subterminal line of the ground colour, inwardly edged with black from dorsum to vein six. Hind wings pale brown, darker on termen; postmedial line dark brown, obtusely angled at vein four; subterminal band dark brown, inner edge diffuse, obsolete towards costa. Under side pale brown; a darker discoidal mark and an elbowed line on each wing; the discoidal mark of fore wings is obscured by a dusky cloud; markings on terminal area as above.

Expanse, 44 millim.

Collection number, 944*a*.

A female specimen from Arizan, August 31st, 1908.

Allied to *T. subpurpurea*, Leech.

Archanara punctilinea, sp. n.

♂. Fore wings pale brownish, irrorated with darker; a brown streak under the median nervure, its outer extremity diffuse; two black marks in the cell; postmedial line indicated by black linear dots on the veins; black dots between the veins on termen. Hind wings whitish sprinkled with brownish, discoidal spot blackish. Under side whitish; all the wings have a dark brown discoidal spot, and a postmedial line indicated by dark brown linear dots on the veins.

Expanse, 36 millim.

Collection number, 147*a*.

A male specimen (condition not very good) from Rantaizan, May 8th, 1909.

Seems to come nearest to *A. ærata*, Butler, from Japan.

Archanara nigropunctata, sp. n.

♂. Fore wings pale pinkish brown, broadly shaded with blackish along the median area from the base nearly to the termen; costal area paler, streaked with brown between the veins; veins one to six whitish, freckled with brown; an almost square black spot in the cell, margined in whitish except on lower edge; a short black dash from base below median nervure; postmedial line indistinct from costa to vein six, thence indicated by black dots on the veins; subterminal line indicated by black dots between veins three to seven; a series of black dots, between veins, on termen. Hind wing fuscous, fringes pinkish brown, marked at their base between veins two to seven. Under side of fore wings leaden grey on the disc, whitish on dorsal area; of hind wings whitish, costal area pinkish brown dusted with darker; discal spots and terminal dots black on all wings; traces of a dusky postmedial line on the hind wings.

♀. Similar to the male, but the whitish outline of cell-spot not so distinct.

Expanse, ♂ 40 millim.; ♀ 44 millim.

Collection number, 137.

One example of each sex from Kanshirei. The female captured July 26th, 1908, and the male on November 14th of the same year.

ODONATA IN THE CHRISTCHURCH DISTRICT, 1911.

By E. J. Burgess Sopp.

Whilst staying in this neighbourhood during the past summer, accompanied by Mr. Philip Dover, I made several expeditions in quest of insects, and our experiences among the dragonflies may be of interest. The "theatre of operations" was limited in area to within a few miles radius of Southbourne-on-Sea, and our observations were confined to the middle and late summer.

It being my first experience of collecting in the district, I am unable to say whether the locality is a generally favourite one with the group, or whether the large number of insects in evidence during 1911 must be mainly attributed to the abnormal weather conditions which prevailed. That the long summer, with its high percentage of heat and sunshine and almost entire absence of wind and rain, would be favourable to the Odonata (especially in such a well-watered centre as Christchurch) seems justly presumable, and it is probable that the conjunction of these factors largely contributed to the extraordinary abundance at certain periods of one or two of the species noted, of which by far the commonest was *Ischnura elegans*, Lind. On some occasions this graceful little dragonfly occurred in the utmost profusion along the banks of the Rivers Avon and Stour, and about the numerous creeks at Wick and Tuckton. During June and July—more particularly in the former month—it was to be met with throughout the surrounding country too—in lanes, meadows, and gardens, often far removed from water.

Regarded solely as a catalogue of species, the appended tale of captures is not a very formidable one. Its interest will lie in its comparison with the experiences of others who may have worked over the same terrain in former seasons, and in the fact that, now Hengistbury Head has been sold, the district may lose much of its wild character in the future.

Sympetrum scoticum, Don.—Hengistbury: not uncommon in July, common at the end of August. Christchurch: Stanpit Marsh.

Libellula quadrimaculata, Linn.—Hengistbury: common in June, scarcer in July. Wick and Tuckton Creeks: common during June. Boscombe.

Orthetrum cærulescens, Fabr.—Hengistbury: not uncommon in July, occasional in August. Mudeford. Bournemouth.

Cordulegaster annulatus, Latr.—A male of this handsome insect was picked up near Pokesdown Railway Station during July, where it had been run over or trodden on in the roadway. A few days later (21st) another insect was seen hawking close to the ground behind a water-cart, but without a net it was impossible to effect a capture.

Brachytron pratense, Müll.—Hengistbury: one, July 1st.

Æschna juncea, Linn.—Hengistbury: August, not at all uncommon at the end of the month. Southbourne. West Moors.

Æ. cyanea, Müll.—Hengistbury: July 31st.

Æ. grandis, Linn.—Christchurch and Tuckton: July. Hengistbury: July and August.

Calopteryx splendens, Han.—Christchurch: very local among sedges and rank herbage on the banks of the River Avon immediately below the Castle Bridge, where it was not uncommon in July. Although the spot was visited many times previously, the species was not seen until the 7th of this month. Females largely preponderated. It may be of interest to mention that during June and July, 1910, many pairs of wings of this species were picked up at Lower Bockhampton, Londs Mill, Stinsford, Winterbourne Came, and Frome Whitfield, in the neighbourhood of Dorchester, although, curious to say, no living insect was ever met with! Search for severed wings near the insect's haunt at Christchurch was unsuccessful, and swallows hawking for gnats, &c., in the immediate vicinity appeared to disregard the dragonflies altogether.

Pyrrhosoma nymphula, Sulz.—Hengistbury and the Christchurch district generally during June and July. Tuckton Creeks: early in August; and one at Hengistbury on the 23rd of the month.

Ischnura elegans, Lind.—Abundant throughout the district from early June to the beginning of August. A few seen at Hengistbury on August 23rd. The deep orange variety, *rufescens*, occurred rarely with the type on the Stanpit Marsh, Christchurch, but was not noticed elsewhere in the neighbourhood.

Bournemouth: February, 1912.

A RARE JAMAICA BUTTERFLY.

By W. J. Kaye, F.E.S.

Quite recently Miss Fountaine, who has just returned from a prolonged entomological trip to the West Indies and Central America, invited me to inspect her captures. Jamaica was one of the islands visited, and amongst the insects from this locality was a very good specimen of the very rare Nymphaline butterfly, *Chlosyne pantoni*, which was described and figured by me in the 'Entomologist' for 1906.

The type specimen there figured was caught as long ago as 1895, and until the capture by Miss Fountaine it was unique.

It must be a very scarce species, for the lucky captor of the second specimen worked hard for further examples, realizing that her insect must be uncommon, although not knowing at the time what the species actually was, but without success.

Miss Fountaine caught her specimen at Troy, on the edge of the remarkable Cock-Pit County, which is of limestone formation. Mr. Panton took the original example in the Manchester Mountains, which even at the nearest point are a good many miles away. The butterfly was taken in wooded country towards the end of January, 1911, and now that we know the exact locality and almost the exact date, it will be interesting to see if further search will be productive of more specimens.

Miss Fountaine took that fine *Papilio, homerus*, on the Cuna Cuna Pass, and saw several specimens of *P. pelaus*; but I feel I must not say more, however—she personally asked me to record a note on the rare *Chlosyne.*

Caracas, Ditton Hill, Surbiton.

ON THE NAME *SYMPETRUM SCOTICUM*, Don.
[Odonata.]

By Herbert Campion.

It would seem that our small black Libelluline, which has been known hitherto as *Sympetrum scoticum*, Donovan (1811), must be called in future *Sympetrum danae*, Sulzer (1776). The reversion to the older name was made by Dr. F. Ris, without comment, in 1909 (in Brauer, 'Süsswf. Deutschl. Odon.' p. 41), and the change is discussed and confirmed in his latest contribution to the Selysian Catalogue ('Collections Selys, Libell.,' fasc. xiii., p. 646; 1911). The possible claims to recognition of certain other old names need not be dealt with here.

There is little in Sulzer's meagre description of *Libellula danae* ('Geschichte der Insecten,' p. 169), for which he gives the habitat Pais de Vaud, to assist one to identify the particular species described. But the coloured figure (*l. c.* pl. xxiv. fig. 3) shows a *Sympetrum*-like dragonfly with bright red eyes; a large spot of the same colour between the fore wings; light green thorax, crossed longitudinally by a wide median black band; a curved black stripe on that side of the thorax which is exposed to view; abdomen dilated a little below the middle, and narrowing again towards the apex, yellow dorsally, bordered by blackish; wings uncoloured; reticulation black; pterostigmata yellow. The characters upon which I lay most stress are the yellow abdomen, bordered with black, and the broad median black band on the thorax.

After careful comparison of the figure with specimens, I have come to the conclusion that, regarded as a whole, it is a recognisable representation of an immature male of *S. scoticum*. I indicate the male, because it seems to me that the figure resembles that sex more closely than it does the female, with which Dr. Ris has identified it. It is true that, as the figure is drawn, only two anal appendages are shown, but the greater resemblance to the immature male is due to the manner in which the black on the sides of the abdomen is represented as encroaching upon the yellow dorsum: in the immature female, on the other hand, the black is confined to the lateral position.

58, Ranelagh Road, Ealing: Feb. 26th, 1912.

BY THE WAY.

"The Essex Field Club has distinguished itself in the self-imposed and entirely honourable task of keeping alive an interest in the past history of the county. It has recently taken in hand the restoration of certain tombs, in the churchyard of Black Notley, of two Essex worthies of the seventeenth century. John Ray distinguished himself for versatility as a linguist, as a botanist and zoologist, and Dr. Benjamin Allen, who is buried near him at Black Notley, was the first scientific student of British mineral waters, and a careful entomological observer . . . and these three men, who were friends and contemporaries, were undoubtedly a remarkable trio, whose light shines through the centuries that have elapsed since they walked and worked together!"—Local paper. The late learned Mr. John Ray, as Derham terms him, we all know through the 'Historia Insectorum,' published posthumously in London, 1710, by Johannes Raius; but who was the second "observer," and wrote he aught entomological?

We have at length received the first volume of the Victoria History of Suffolk, which was published on 31st of last January. The second volume appeared several years ago, but the present has been much delayed from various more or less obvious causes. This one contains the Fauna of the county, and a pretty long catalogue it is. Considering the extreme paucity of observers, and several of those we had ten years ago are departed, the list is a capital one in both botany and zoology. The insects were revised to October, 1907, and show the following totals:—Coleoptera, 1930 species; Hemiptera, 537 species; Orthoptera, 22 species; Neuroptera, 164 species; Lepidoptera, 1290 species; Hymenoptera, 1241 species; and Diptera, 1171 species. The grand total amounts to 6355 different kinds of insects out of a

British total computed at 14,678. This must be considered satisfactory for an area of 1500 square miles, *i.e.* 32 north and south, 56 east and west; but a glance at the supersoils, chalk, sand, clay, peat, and crag, and at the eastern coast-line, southern timber-belts, north-western breck-sands, and north-eastern broad-land will show how rich this county naturally should be in its extremely variable character.

We have had to have recourse to the current quarterly 'Deutsche Entomologische Zeitschrift' for a review of the latest part of 'Biologia Centrali Americana.' Do not we receive this kind of publication for review, or do our editors consider the subject too trans-Atlantic to interest British readers? We know no collectors who have done their work better than those who assisted MM. Godman and Salvin in their great and beautifully executed task.

C. M.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Continued from p. 136.)

THE 27th was fine and warm, with a light north-easterly breeze. I went to the distant woods. *A. euphrosyne* was now out in abundance, and getting worn; *A. selene* just appearing. I saw three or four *N. lucina* and two *Hemaris fuciformis*. By beating I obtained a few each of *Lithosia areola*, *Erastria* (*fuscula*) *fasciana*, *Lobophora hexapterata*, *Cidaria corylata*, *Euchœca obliterata* (*heparata*), *H. barbalis*, &c., but common things were far from abundant. The pretty little *Roxana arcuana* was flying merrily over hazel-bushes, and a pair of *Dasychira pudibunda* were taken *in cop.* high up on a bare aspen pole where they looked very conspicuous. *N. pulveraria* were still appearing in my breeding-cages, and one *Eurymene dolobraria* was also bred. The 29th was fine and bright. I went to the woods in the forenoon and beat one *Drepana hamula* female (which I kept for eggs), one *A. betularia* (typical), several *Asthena candidata*, and *Tortrix ministrana*, but saw little else. In the evening I noticed many half-grown larvæ of *Leucania straminea* on reeds in a dyke on the marshes. The 30th was lovely and warm in the evening, *Perizoma affinitata* and *P. decolorata* were flying in great numbers along a hedgerow overgrown with *Lychnis dioica*. At sugar *N. rubi* was abundant, and one *H. pisi* appeared, but nothing else.

On June 7th I went to Castor, near Peterborough. The 8th was a fine hot day. I went to the woods and found I was too late for *Carterocephalus palæmon* (*paniscus*); I saw many, but they were all too worn to take. *A. euphrosyne*, *Hesperia malvæ* (*alveolus*), and *Thanaos tages*, were flying about blackberry blossom, but were also much worn. One *Parasemia plantaginis* was disturbed out of some rough herbage, where also rather a nice form of *Ematurga atomaria* was plentiful, but very few Geometræ were seen, and those only common species. Beating produced a few larvæ of *Polyploca ridens*, *Tæniocampa populeti*, and *T. munda*. On a sunny bank, overgrown with thistles and *Ononis*, *L. straminea* was plentiful, and larvæ of *Amblyptilia acanthodactyla* were abundant on the *Ononis*, and in a swampy place the larvæ of *Tortrix costana* were numerous, spun up between turned-down or rolled-up tips of leaves of yellow iris, but they were terribly ichneumoned.

On the 10th a friend motored me to the celebrated Monk's Wood, a locality I had long wished to see. We arrived there about 7 p.m., a lovely fine calm evening, and the wood looked as if it ought to be a perfect entomologist's paradise. But, sad to say, nothing appeared to be moving. The wind was from the north-east, and soon after our arrival it began to feel chilly, a heavy dew set in, with slight ground fog in the damper places. The first thing that I noticed upon entering the wood were the numerous privet bushes, some of them already coming into flower, which reminded me that these flowers are attractive to *Thecla pruni*, so I wondered if it were possible to find a larva or two of this species. There were plenty of sloe-bushes about, but a very cursory glance at these revealed the fact that they had recently had a tremendous thrashing by some too ardent collector—or collectors I should think by the results of their efforts—for every likely-looking bush had been well flogged, many of the branches were broken, and the leaves were withering on the mangled twigs. No wonder that this very local species is being rapidly exterminated! In one spot I found a few stunted bushes, not much more than a foot high, that had escaped the beating-sticks, and upon examining these obtained three half-grown larvæ of *T. betulæ*, but no *pruni*. We had intended to try sugar, but as it continued to get colder and the dew and fog increased, we decided it would be no good, so left the wood about nine o'clock and motored home.

The 11th was fine, with sun and cloud, a light northerly breeze, and a little warmer. This being Sunday I did not go collecting in the forenoon, but in the afternoon went for a stroll to a fir plantation not far from the house, having put my net and a few boxes in my pockets. Tortrices were plentiful, and dozens flew out every time I beat the branches; but there were only two species, in about equal numbers: *Coccyx tædella* and

Retinia pinivorana, both in very fresh condition; and I was pleased at getting a nice series of the latter. In the evening I tried sugar on the trees in the gardens and shrubberies, but saw nothing but a few of the most common species. There was so much honey-dew that moths would hardly look at sugar.

(To be continued.)

NOTES AND OBSERVATIONS.

Idiaspa maritima, Hal., in Suffolk.—This species has not been discovered outside the British Isles. Haliday described it in the old Ent. Mag. 1838, p. 230, under the name *Alysia maritima*, adding, "Habitat sub fucis marcentibus in littoribus Hiberniæ borealis rarissime—Hantoniensibus, *F. Walker*; Eboracensibus, *T. G. Rudd*—qui plura examplaria mecum benevole communicavit." It was not again mentioned in literature till the publication of the Rev. T. A. Marshall's "Monograph of British Braconidæ," when (Trans. Ent. Soc. 1894, p. 522) he says it occurs sparingly amongst decaying seaweeds on the coast, quotes the above, and adds: "I have taken it on Lymington Salterns, and Mr. Billups found it at Dulwich." This is all we know of the species, for the same author's reference to it, "Il se trouve parmi les algues pourrissantes, aux bordes de la mer, et dans les salines, mais pas communement. Côtes d'Angleterre et d'Irlande" (Bracon. d'Europ. ii. 399), adds nothing. I was, consequently, delighted to take a male of this rare (or overlooked) species on September 1st, 1911, walking leisurely and somewhat sluggishly on the unusually dry mud among the close-set roots of the reeds in Covehithe Broad, on the Suffolk coast, within a quarter of a mile of the sea, but at a spot where the water is at most brackish and by no means salt, and to which seaweed certainly never extends. It will doubtless be found parasitic upon some semi-saltmarsh Dipteron, possibly *Platycephala planifrons*, F., or *Ephydra riparia*, Fln., which occurred in some numbers on the surrounding reeds.—Claude Morley; Monk Soham House, Suffolk.

The Summer of 1911 and the present Season.—It will be of special interest this year to note what effect, if any, results from the abnormal season of last year. By way of preliminary record I am able to state that in Bury Wood, Epping Forest, last month *H. leucophæaria* was unusually common. As early as January 1st a specimen of *P. pedaria* was taken and forwarded to me from Paisley, Scotland. On February 26th another specimen, almost black, was sent to me from the same town, both specimens having been taken from the street-lamps. This afternoon, on the tree-trunks in the Ilford Road, *B. hirtaria* was, without exaggeration, swarming. I have never in the whole course of my experience seen this moth so abundant. On the trunks of two rather small lime-trees in one front garden a friend who was with me and I counted twenty-eight and seventeen respectively. It remains to be seen whether other species appear in such profusion. By way of explanation I am inclined to believe that the wonderful spell of weather last year caused such abundance of insect life that the town birds (sparrows, &c.) which keep such species as *B. hirtaria* in check had an ample supply of food, and that the persecution of caterpillars was in consequence below the normal standard.—R. Meldola; 6, Brunswick Square, W.C., March 30th, 1912.

Large "Coppers" in Wicken Fen.—The late Mr. Verrall, it will be recalled, was anxious to re-establish *Chrysophanus dispar* with its nearest existing representative *C. rutilus*. To this end he caused to be "planted" in various parts of Wicken Fen a number of larvæ in the year 1909. I was at Wicken at Easter this year, and called on Mr. G. Bailey, the son of Solomon Bailey, who died two years ago, but who was responsible for the putting out of the larvæ. I learned from Mr. Bailey that not a single "copper" had been seen, and that he accounted for the fact by the abnormally wet and cold summers of 1909 and 1910. Even if the "coppers" had hatched, he pertinently remarked that there was not a great deal of *Rumex hydrolapathum*, their food-plant. In this matter Mr. Bailey is quite correct, and as the water dock requires water to grow in, it does not get much chance of spreading at Wicken, for except in the shallow ditches it can scarcely find suitable spots, all the "lodes" or large watercourses being kept clear of herbage for the adequate drainage of the land. This, however, is a secondary matter; but if further attempts be made to establish large "coppers," it should be borne in mind that scarcity of the food-plant will be a factor acting against success.—W. J. Kaye; Caracas, Ditton Hill, Surbiton.

Pararge egeria: Early Appearance.—This species was seen in the New Forest at Eastertide, and about April 22nd it was quite common. I am indebted to Mr. W. J. Lucas for these facts.—Richard South.

Callophrys (Thecla) rubi: Early Appearance.—April 21st would appear to be an early date for the emergence of *Thecla rubi* in a northern locality. I have pleasure in recording the capture by Mr. A. Graveson of three newly-emerged specimens on the neighbouring high-lying moorland, 1000 ft. elevation. The previous earliest mention of the species in my diary is May 4th. The weather of the past week has been exceptionally warm and summer-like.—Frank Littlewood; 10, Aynam Road, Kendal.

[Mr. Lucas informs me that a specimen of *Callophrys rubi* was seen in the New Forest on April 18th.—R. S.]

Pyrameis cardui in April.—This morning, while out walking, I saw, and nearly caught, a large specimen of *Pyrameis cardui* settling on dandelions along the roadside. Would this be an early immigrant or a hybernated specimen? In 'Butterflies of the British Isles' it is stated that, so far as is known, the butterfly does not hybernate. I don't know therefore whether you would consider this worth recording or not. The mildness of the climate here might enable this species to hybernate in this locality, as frost and snow are practically unknown.—HUGH F. STONEHAM; Kinsale, co. Cork, April 1st, 1912.

CELASTRINA (CYANIRIS) ARGIOLUS IN APRIL.—It may be worth recording that *C. argiolus* was seen at Chingford on Saturday, April 13th. Several examples were seen by friends during the week following at Clapton.—R. T. BAUMANN; "Glendale," Chingford, Essex, April 22nd, 1912.

CALYMNIA (COSMIA) PYRALINA IN WEST SURREY.—Last July or August I captured two specimens of the above at Elstead, between Godalming and Farnham. I believe that this insect has not been reported to have been observed in this district before. — H. O. HOLFORD; Elstead Lodge, Godalming.

TEPHROSIA PUNCTULARIA IN EARLY APRIL.—While out this afternoon, not far from Reading, I took among other insects two specimens of *T. punctularia* at rest on tree-trunks. Is this not rather an early date for this species? all the books I have looked over say May and June.—H. L. DOLTON; 27, Brunswick Street, Reading, April 4th, 1912.

BOARMIA CINCTARIA.—Mr. Lucas found a specimen at rest on April 8th, and during the third week of the month the species was plentiful in the New Forest.—RICHARD SOUTH.

NOTES ON LEPIDOPTERA AT GRASSINGTON IN 1911.—My first visit was paid on June 21st, a fine sunny afternoon. In the woods a search on tree-trunks revealed specimens of *Melanthia albicillata*, *Larentia pectinitaria*, one specimen of *Coremia designata* (*propugnata*), *C. ferrugata*, a worn example of *Cidaria suffumata*, and one *Hadena dentina*; while on a beech-tree a pair of *Lophopteryx camelina* were found *in cop.* Flying in open spaces near the top of the wood were *Lycæna astrarche* (*agestis*) and a few *Acidalia fumata*, chiefly males. One specimen of *Ino geryon* was taken, and at dusk a female *Hepialus hectus* was netted. Beating the bushes produced one *Venilia maculata* and several *Emmelesia alchemillata*; the latter were already worn, while *Tortrix palleana* in fine condition seemed plentiful. Flying in the sun was the beautiful *Ennychia octomaculata*, and also *Pyrausta purpuralis*. Sitting among the long grass a female *Parasemia plantaginis* was discovered. In July a few days (8th to 13th) were spent in the vicinity, chiefly in the Grass Woods, where *L. astrarche* was now very worn, three or four specimens only of *L. icarus* were seen, but *Erebia æthiops* (*blandina*) was not yet out. Probably the best species taken was *Phothedes captiuncula*, which was flying in and out among the bushes in the open spaces near the top of the wood, but was most difficult to capture. It was on the wing but for a few minutes at a time, and could only be taken when there was a fair amount of sunshine. There seemed to be a fair proportion of the reddish form. Of other things seen, *Acidalia fumata* was nearly over, but some nice females were secured. *Tanagra atrata* was flying in the sun, *Boarmia repandata* (on tree-trunks) and *Cidaria pyraliata* occurred, and *Metrocampa margaritaria* was common at dusk. On the walls near the village several *Nudaria mundana* were seen; and in a garden *Cidaria associata* (*dotata*), *C. prunata*, and *Boarmia gemmaria* were flying at dusk, and also caught by the light from the windows. *Plusia pulchrina* was taken at rest, and *Abrostola triplasia* flying over nettles. The moors were not visited, as it was far too hot to roam about in the scorching sun.—W. G. Clutten; 132, Coal Clough Lane, Burnley.

"New Forest Notes, 1911."—The New Forest being almost "my native heath," I was much interested in Mr. Lyle's notes (pp. 126–130), especially as it is some years since I have been there. I have never been fortunate enough to see *Aporia cratægi* in the Forest, but I had the pleasure of taking some specimens of *Melanargia galatea* there on July 9th, 1889. There was a small colony of them in a damp rushy spot in Ironshill Enclosure, near Lyndhurst Road Station, and as the morning was dull and somewhat heavy they were very lethargic, and many of them seemed to have just emerged. *Argynnis adippe* was common in the same spot, settling as usual on the flowers of the marsh plume thistle, but *galatea* was mostly on the tall grass and rushes. I seem to have had the melancholy privilege of taking one of the last of the New Forest *Leucophasia sinapis*, for I captured a male specimen in Stubby Copse on June 13th, 1888, which is well within the thirty years suggested by Mr. Lyle as the time elapsed since its disappearance. I was glad to see the records of *Gonepteryx rhamni* hybernating in ivy, as, although holly is so much more abundant in the Forest than the flowering ivy, the butterfly's wings so much more closely resemble yellow ivy-leaves in shape and colour that it has always seemed more probable to me that it hybernated in ivy than in holly, although it has been found also amongst the latter. The reason why the specimen in question was so much easier to see at night than by day was obviously that during the night there is no top light shining through the bush and therefore no shadows from above, whilst at night the lantern light shines from below and the leaves catching it at a different angle do not throw such broad shadows, which, however, are more dense and therefore contrast more sharply with the colour of the insect.—C. Nicholson; Hale End, Chingford.

Correction.—Owing to an error, *Erebia melampus* should have read *Erebia cassiope* in my article on butterflies at Digne in last month's number of the 'Entomologist.' *E. cassiope* was common on the Doubs on July 31st last summer. *E. melampus* has, I believe, never yet been taken on the Doubs, though Oberthür mentions it as occurring in the Basses Alpes.—Gerard H. Gurney; Keswick Hall, Norwich.

Collecting in Westmorland, 1911.—The following *résumé* of the season 1911 is, mainly, an account of work done in the environs of Kendal by two entomological friends, Messrs. A. Graveson and T. Smith, and myself, with substantial assistance from Mr. R. H. Mallinson who has provided the Windermere records.

The season opened inauspiciously, the almost incessant rain of the early months being followed by a weary period of five weeks' persistent and very cold north-easterly wind. Spring geometers were noticeably scarce, with the single exception of *Hybernia rupicapraria*, which could be taken in numbers on the hawthorn hedges on the few mild evenings of early January. Mr. Mallinson reported males of *H. leucophæaria* common on lamps at Windermere, but our own experience with this species was not encouraging. Four specimens were taken on January 27th, no more being seen until March 3rd, when eleven males, including four of the var. *marmorinaria*, were boxed from the oak-trunks. Again, this year, no females could be found, although the trunks and the grass around were carefully examined after dark, and the lower branches of the trees beaten. *Phigalia pedaria* seemed to be entirely absent, and I do not remember seeing a single example. A few night-feeding larvæ turned up on March 23rd, including *Xylophasia rurea*, *X. hepatica*, and *Apamea unanimis*. Larvæ of *Agrotis lucernea*, notwithstanding the cold, were well advanced and approaching full growth by March 29th, and one can only surmise that they had made good progress during the milder though very wet month of February. *Polyploca flavicornis* appeared at the Windermere lamps in late March, and was accompanied by numbers of the commoner Tæniocampids. Of the last, *T. munda* was more than usually abundant, and a fine and variable series was taken. This species comes to light at a late hour, the bulk of the captures being made after 12.30 a.m. The all too brief cessation of the wind was taken advantage of by Mr. Mallinson, who reported the Windermere sallows to be "alive" with moths on the evenings of April 1st and 2nd. Amongst an abundance of *Tæniocampa instabilis*, *T. stabilis*, *T. gothica*, *T. cruda*, and *T. munda*, he took several *T. rubricosa*, two *T. leucographa*, one *Panolis piniperda*, one *Calocampa exoleta*, and one female *D. templi*. On April 6th, again windy, *Anisopteryx æscularia* was found fairly plentifully sheltering beneath projecting pieces of bark on the tree-trunks and lower branches, and even under loose stones at the foot of the tree. On April 14th a specimen of *Pieris brassicæ* was seen flying in the garden; possibly the pupa had wintered in some greenhouse, as the conditions outside had not been of a kind to tempt a natural early emergence. Mr. T. Smith discovered in sloe bloom a rival to the sallows, the flower attracting all the commoner Tæniocampids, and in addition, on April 16th, a beautiful female *Lobophora polycommata*, and on the 23rd an odd *Panolis piniperda*. At the end of the month the forcing-cage produced two fine melanic female *N. dromedarius*; a series of *A. rumicis* var. *salicis*, and an odd specimen of *Eucosmia undulata* from larva found on sallow on the "moss" in the previous August.

With the advent of May, however, the weather improved, and we felt that at last we had said "good-bye" to winter! On the 10th *Pieris rapæ*, *P. napi*, and *Euchloë cardamines* were observed, and after dark *Lampropteryx suffumata*, *Melenydris salicata*, and *Lozogramma petraria*, the latter resting on the dead brackens in the wood. Night-feeding larvæ were not really plentiful; but our captures, principally on heather, hawthorn, birch, and bilberry, included *Eurois prasina*, *Triphæna fimbria*, *T. ianthina*, *Noctua brunnea*, *N. augur*, *N. triangulum*, *N. festiva*, *N. glareosa*, *Aplecta* *nebulosa*, *Leucania lithargyria*, *Agrotis agathina*, *Noctua castanea*, *Plusia interrogationis*, *Boarmia repandata*, *Lygris populata*, *Entephria cæsiata*, and *Acidalia fumata*. A nice little colony of eighteen larvæ of *Cirrhœdia xerampelina*, full-fed on May 14th, was the reward of pulling off not more than a square foot of moss on an ash-trunk, but we could not repeat this performance, diligent search afterwards discovering only an odd larva here and there. The species is not rare in the district, ash being one of our commonest trees. Larvæ of *Satyrus semele* and *Gnophos obscurata* were found full-grown on May 14th, the former on grass, the latter on half-a-dozen different rock plants, of which a dwarf variety of the common ox-eye daisy seemed to be preferred. Several perfect *Selenia lunaria* were netted on the 16th, and *Tephrosia crepuscularia*, single-brooded only here, was plentiful in the daytime on oak and larch trunks. The green ova of the latter species, laid in batches, are pushed well into the crevices of the bark and covered over with loose woolly-grey scales.

Throughout May, Mr. Mallinson worked the street lamps with a zeal that certainly merited reward. The illumination provided by the Windermere electric current appears to be appreciated by the moths if not by the residents. The reddish glow of these electric lights proved so much more attractive than the brighter blaze of the incandescent gas-lamps that the latter were very soon abandoned. Again, the electric lights are more favourably situated at the outskirts of the town, in close proximity to several well-wooded estates and private gardens. Mr. Mallinson states that at this season of the year it is useless to begin "lamping" before eleven o'clock, and all the captures recorded below were made between that hour and 1 a.m. Swarming each lamp-post is a necessary part of the business, as all the best things rest on the dark framework of the lamp, and are invisible from the ground; so that a night's work, consisting of three rounds of a mile of lamps, provides enough exercise for even the most enthusiastic collector. It was a great disappointment not to be able to continue the good work during the summer months, and we felt very little sympathy with the economical official mind that suspended the lighting of the lamps between May 21st and August 1st. From May 11th to 19th Mr. Mallinson's captures at these lamps included *S. populi* (one), *N. chaonia* (one male, one female), *P. dictæoides* (common), *P. tremula* (one), *N. trepida* (nine), *N. ziczac* (one), *P. palpina* (one), *D. coryli* (three), *H. pisi* (one), *S. pavonia* (one female), *S. menthastri* (common), *G. bidentata* var. *nigra* (one), *E. dolobraria* (one), *E. silaceata* (one), *T. dubitata* (two), *B. temerata* (two), *C. designata* (two), and an abundance of *T. crepuscularia*, *L. suffumata*, *M. fluctuata*, *L. petraria*, *S. bilunaria*, and *A. nigrofasciaria*, the last-named species notable for its large size and dark purple clouding. On the night of May 18th, after a two hours' back-aching search by lamp-light on the "moss," a solitary full-fed larva of *Cænonympha typhon* was found feeding on the short green spikes of *Rhynchospora alba*. Had we been earlier I have no doubt more would have been obtained, for the insect abounds in this locality. A careful examination of the Cotton-grass, growing amongst the former plant, failed to discover any larvæ; but

I should not like to conclude, upon this slender evidence, that the Beaked Rush is the exclusive food. In all the damper parts of the "moss," where *C. typhon* flies, Cotton-grass flourishes equally with *R. alba*. On May 21st a specimen of *Scodiona fagaria* was taken, our first intimation of the approaching early season. Seven fresh *Thanaos tages*, one *Chrysophanus phlæas*, and several *Euclidia mi*, were netted on the 23rd, and at dusk *Coremia ferrugata*, *C. designata*, *M. salicata*, *Hydriomena ruberata*, *Eulype hastata*, and *Perizoma flavofasciata*. Two *Hipocrita jacobææ* were observed on a street lamp at 12 p.m. Ova of *Epione apiciaria*, kept outside during winter, did not begin to hatch till May 31st. The young larvæ fed-up well for three weeks, and then for no apparent reason died off. Young larvæ of *T. crepuscularia* preferred buckthorn to oak, and grew to an enormous size before pupating. Larvæ of *Amathes lota* were beaten from sallow at the end of the month.—FRANK LITTLEWOOD.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 7th*, 1912.—The Rev. F. D. Morice, M.A., President, in the chair.—The President announced that he had nominated as Vice-Presidents for the present session Mr. A. H. Jones, Dr. Malcolm Burr, and Mr. J. H. Durrant.—Mr. W. E. Sharp exhibited specimens of *Carpophilus 6-pustulatus*, F., and *C. obsoletus*, Er., taken under bark of beech-trees, near Doncaster, in October, 1912.—Professor Poulton, a large but not quite complete series of the members of the important combination of Geometrid moths of the genus *Aletis*, and their mimics, collected between May 23rd, 1909, and September 14th, 1910, by Mr. C. A. Wiggins, D.P.M.O. of the Uganda Protectorate, in the neighbourhood of Entebbe. Professor Poulton also exhibited part of an all-*anthedon* family, recently bred by Mr. Lamborn at Oni Camp, seventy miles east of Lagos, from an *anthedon* female parent, and part of an all-*dubius* family, also bred from an *anthedon* female; also specimens of the Lasiocampid moth, *Mimopacha gerstæckeri*, Dewitz, bred from the caterpillars referred to by Mr. Lamborn. The hairs on the larvæ are intensely urticating, and, as they come off readily, float in the air if there is any draught. They get into the eyes and produce a troublesome conjunctivitis. Professor Poulton drew attention to the following observation recently made by Mr. Lamborn at Oni:—"On December 27th I saw a male *Glutophrissa saba* courting a female. She was resting on a leaf with wings expanded. Her abdomen was raised to an angle of rather more than forty-five degrees to the thorax, and two little tufts very similar to those possessed by male Danainæ protruded from the anal extremity."—Dr. Malcolm Cameron, a new species of *Vesperus* from Lagos, Portugal, *V. reitteri*, and for comparison a specimen of *V. bolivari*, Rtt. In both cases the females are unknown.—Mr. E. A.

Cockayne, the following specimens of the genus *Oporabia*: *O. christyi* from Ireland and Scotland, hybrid *O. christyi* ♂ × *O. dilutata* ♀, and *O. dilutata* ♂ × *O. christyi* ♀; *O. dilutata* from Scotland and Epping Forest, hybrid *O. dilutata* ♂ × *O. autumnaria* ♀, and larva; *O. autumnaria*, hybrid *O. autumnaria* ♂ × *O. filigrammaria*, ♀ and *O. filigrammaria* ♂ × *O. autumnaria* ♀; *O. filigrammaria* from Yorkshire and Scotland.—The following papers were read:—"On Some hitherto imperfectly known South African Lepidoptera," by Roland Trimen, M.A. F.R.S. "On the Comparative Anatomy of the Genital Tube in Male Coleoptera," by D. Sharp, M.A., F.R.S., and F. Muir, F.E.S. "Descriptions of New Species of Lepidoptera-Heterocera from South-east Brazil," by F. Dukinfield Jones, F.Z.S., F.E.S. "The Effect of Oil of *Citronella* on Two Species of *Dacus*," by F. M. Howlett, B.A., F.E.S. "On the Genera *Liothrips* and *Hoodia*," by Dr. H. Karny, of Elbogen, Austria; translated by E. A. Elliott, F.E.S., and communicated by R. S. Bagnall, F.L.S. "On the Early Stages of *Albulina pheretes*, a Myrmecophilous Plebeiid Butterfly," by T. A. Chapman, F.Z.S. "The Food-plant of *Callophrys avis*," by T. A. Chapman, F.Z.S. "An Experiment on the Development of the Male Appendages in Lepidoptera," by T. A. Chapman, F.Z.S. "The Study of Mimicry (Batesian and Müllerian) by Temperature Experiments on two Tropical Butterflies," by Lieut.-Col. N. Manders, R.A.M.C., F.Z.S., F.E.S. A long and important discussion arose on many points in connection with the last paper, in which several Fellows took part.

Wednesday, March 6th, 1912.—The Rev. F. D. Morice, M.A., in the chair.—The following gentlemen were elected Fellows of the Society:—Messrs. Harold Hodge, Chapel Place Mansion, 322, Oxford Street, W.; Samarenda Maulik (Calcutta), c/o Messrs. T. Cook & Son, Ludgate Circus, E.C.; Roland T. Smith, 54, Osbaldeston Road, Stoke Newington, N.—Mr. Donisthorpe exhibited a specimen of *Catops montivagus*, Heer, new to the British list, taken at Nethy Bridge on June 27th last, under a dead squirrel; also *C. tristis*, Panz., for comparison, the nearest species previously known as British.—Professor Poulton, the first of three families of *P. dardanus*, Brown, bred from *hippocoon*, F., females in the Lagos district by W. A. Lamborn, and a part of the second. He stated that these three families were the first successful attempt, outside Natal, to breed *P. dardanus* from a known female parent. He also drew attention to the following letter, received by Mr. W. A. Lamborn from Captain H. V. Neal:—"You have asked me about monkeys eating butterflies. This is very common, as every native will tell you. I have seen it myself. The monkey runs along a path, sees some butterflies fluttering round some filth, goes very quietly and seizes one by the wings, puts the solid part [body] into his mouth, and then pulls the wings off. The poor butterfly goes down like an oyster." Professor Poulton said that he had now submitted to Professor R. Newstead some of the Coccids which formed the food of *S. lemolea*, H. H. Druce. They had been sent in spirits by Mr. W. A. Lamborn and, although unfortunately badly attacked by fungus, had been placed without hesitation in the genus *Dactylopius* by Professor Newstead. Professor Poulton exhibited examples of *Eurytela dryope*, Cramer, and *E. hiarbas*, Drury, bred by Mr. W. A. Lamborn in the Lagos district. Mr. Lamborn had bred considerable families of *dryope* three times, and *hiarbas* once, from known female parents. The *dryope* parents produced nothing but *dryope*, the *hiarbas* nothing but *hiarbas*. It was therefore almost certain that the two forms were distinct species, at any rate in the Lagos district. Professor Poulton exhibited specimens of Pseudacræas, &c., captured on December 3rd, 10th, and 17th, 1911, by Dr. Carpenter, in the primitive forest which still exists in the centre of Damba Island.—Mr. A. E. Gibbs, two specimens of the scarce butterfly *Baronia brevicornis*.—Mr. Douglas Pearson, a drawer of aberrations of the genera *Melitæa* and *Erebia*, amongst which were some striking forms of *E. stygne*, *E. ceto*, and *M. varia*, as well as a remarkably variegated female of *M. aurelia*, generally speaking the most constant of the group.—Dr. Jordan, on behalf of Dr. Malcolm Burr, two specimens of a new Dermapteron, discovered in vast numbers in a cave in Java, for which a new suborder is required.—George Wheeler, M.A., *Hon. Sec.*

RECENT LITERATURE.

Dermaptera (Fascicule 122 of the 'Genera Insectorum'). By M. Burr, D.Sc. Pp. 112; illustrated by eight coloured and one plain plate. Brussels, 1911.

Such a publication as the one before us cannot but mark an epoch in the history of the Dermaptera, a group of insects better known to the ordinary naturalist as the "earwigs." One publication only would be even more welcome—the promised monograph of these insects which our author has in hand. Owing to a great extent to the comparative scarcity of material the classification of these ancient, and therefore specially interesting, creatures has been in an almost hopeless state of confusion, but the strenuous labours of Burr and others have altered the position of affairs. In the fine volume devoted to the Dermaptera in the 'Fauna of British India,' Dr. Burr gave us a definite scheme of classification of the earwigs, and in the present publication we have it brought still further up to date. In the Introduction will be found the principles of classification adopted. Differences in the genitalia must, of course, enter largely into the various diagnoses, but we are glad to find that Burr does not consider them all-important. The average entomologist, though he may not be specially a student of the earwigs, will often like to properly place his specimens, and he will have a much better chance of succeeding if he has not to depend entirely on such an abstruse point as the construction of the genitalia.

It is to be hoped that the system of classification and the nomenclature of the earwigs is now fairly fixed. The seven hundred and one species here enumerated are distributed amongst eight families, including the Arixeniidæ and Hemimeridæ with one species each. These families of parasitic insects are much more pronouncedly distinct than the other families, but it appears to be settled now that they belong to the earwigs. Whether these, with the true earwigs, should be given ordinate rank seems to be debatable. On the same terms the list of natural orders would probably become as unmanageable from the greatness of its numbers as it was previously from the paucity in that respect. Possibly, however, this is unimportant, as these insects constitute a thoroughly compact and natural group—though not more distinct than their neighbours, the cockroaches.

Our own little company of seven species, which as breeding in these islands may all be considered British (though two have been introduced), are, indeed, lost amongst the seven hundred odd species here enumerated. As, however, to us they are important, they are here quoted:—

	Family.	Subfamily.
Anisolabis annulipes	Labiduridæ	Psalinæ.
Labidura riparia	Labiduridæ	Labidurinæ.
Labia minor	Labiidæ	Labiinæ.
Prolabia arachidis	Labiidæ	Labiinæ.
Apterygida albipennis	Forficulidæ	Forficulinæ.
Forficula auricularia	Forficulidæ	Forficulinæ.
Forficula lesnei	Forficulidæ	Forficulinæ.

Three others (perhaps more) have occurred sporadically:—*Anisolabis maritima* (fam. Labiduridæ, subfam. Psalinæ); *Chelisoches morio* (fam. Chelisochidæ, subfam. Chelisochinæ); and *Anechura lewisi* (fam. Forficulidæ, subfam. Anechurinæ).

In type and get-up this fascicle has a particularly pleasing appearance, while the plates are indeed excellent. Sixty species are figured in colours, a number of others are plain, and there are numerous beautiful drawings of details.

It would be very nice of the author if he would publish periodically notes which would keep up to date all those—an increasing number, we hope—who are interested in the earwigs.

W. J. Lucas.

Annals of Tropical Medicine and Parasitology. Liverpool.

The two parts just received contain little of purely entomological interest, four short notes only falling under this head. In Series T. M. vol. v. No. 3, Dec. 30th, 1911, we have: "Some Experiments on Larvicides," by Sir R. Ross and E. S. Edie (pp. 385–390); and "An Examination of the City of Georgetown, British Guiana, for the breeding-places of Mosquitos," by K. S. Wise (pp. 435–441). In Series T. M. vol. v. No. 4, Feb. 26th, 1912, there are: "The Genus *Pristirhynchomyia*, Brunetti" (Diptera), by Capt. W. S. Patton and Capt. F. W. Cragg (illustrated, pp. 509–514); and "The Life-history of *Philæmatomyia insignis*, Austen" (Diptera), also by Patton and Cragg (illustrated, pp. 515–520).

W. J. L.

Obituary.—We regret to learn that Professor John B. Smith, State Entomologist of New Jersey, U.S.A., died on March 12th last.

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NOTES ON *RHOPALOSIPHUM SOLANI*, Kaltenbach.

By Fred. V. Theobald, M.A., F.E.S., Hon. F.R.H.S.

I found this aphis on potato-haulm at Wye in June and July, 1911, but only a few apterous females and a single winged female on June 28th. In February of this year a number of seed potatoes were sent me from Folkestone, the sprouts so badly attacked by aphis that they were all dying off, and the thick honeydew formed by the "dolphins" had smothered the tubers, which gradually turned brown and rotted away.

On comparing the wingless females with those I found on the potato-haulm in June and July of last year I found them to be identical, and they agree exactly with Kaltenbach's description of *Aphis solani* (Mono. Pflanzenlause, p. 15). This is placed as a synonym of Schrank's *dianthi* by Buckton. No damage has been reported as caused by this aphis to my knowledge, but John Curtis, in his famous work on Farm Insects, refers to aphis on potatoes (pp. 68 and 428), and calls them *Aphis rapæ*, or *vastator*.* Writing on the aphis in connection with potatoes he says: "That aphides will puncture the potato-leaves there can be no doubt and so incline them to wither, but there is no proof of them poisoning the plant and so causing the rot . . . . but in no instance have I seen aphides on potatoes in sufficient numbers to destroy the crop, or even to injure the produce." He then lists the aphides he had found on the potato, namely, *Aphis rapæ*, Curtis; *A. humuli*, Curtis; *A. persicæ*, Morren; *A. fabæ*, Morren; and *Schizoneura lanigera*, Haussman; and refers to the last as being only an accidental visitor.

The specimens I received from Folkestone were nearly all apterous females; on February 25th I found a few nymphs, and on March 1st winged females commenced to appear.

Kaltenbach only describes the wingless form, consequently I describe in detail the alate female here. At the present time (May 24th) they are still breeding on potatoes, alate forms occurring irregularly.

It may also be pointed out that in each of the six colonies sent me there were some pink forms mixed with the green and yellowish green normal specimens. The winged females that have come from the pink forms are identical with those from the green ones.

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* *Aphis vastator*, Smee, is considered by Schouteden to be *Rhopalosiphum dianthi*, Schrank.

I found that this aphis lives quite well underground, and the alate females emerged from the soil in which I had placed one of the diseased tubers. It thus looks as if this aphis lays its ova on the tubers in the autumn, and there they remain until they sprout and so are ready to work on the young shoots. A few years ago I remember finding a few aphis eggs on some potatoes, and probably they were of this species.

I have no other records of it outside Kent except Kaltenbach's. Walker in his List (p. 990) also refers to it with a query as a synonym of *dianthi*, Schrank. It clearly comes in the genus *Rhopalosiphum*, the cornicles being most marked in the alate and apterous females, but not in the larvæ and nymphs.

Alate female, first generation.—Head black; antennæ brown, basal segment black, the second also rather dark, the third a little longer than the fourth, the fourth a little longer than the fifth, the sixth nearly as long as the fourth and fifth, the third with eight to ten sensoria on one side along nearly the whole length of the segment, the remainder of segments are striated (Fig. I., A).

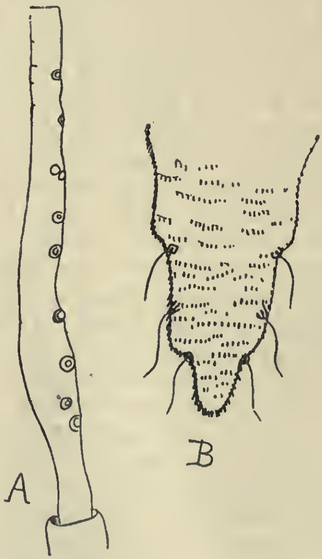

Fig. I.—*Rhopalosiphum solani*, Kalt.
A. Third antennal segment (winged female). B. Cauda.

Thorax: collar yellow, disc black in the centre, yellowish around and on the sides, which have also black areas. The black area not markedly trilobed as in *R. dianthi*.

Abdomen deep yellowish green with black transverse bars, thin and indistinct on the first two segments, which have sub-median black spots, the bars thick in the middle four segments, usually uniting into a dark mass, and there are also large prominent lateral black spots; a dark area running from base of conicles to the cauda. The cornicles dark and slightly swelling towards their apices, cauda dark, acuminate, with three pairs of lateral hairs, surface and edges spiny. Legs yellowish, femora black on the apical half, apex of tibiæ and tarsi black, the paired ungues rather long.

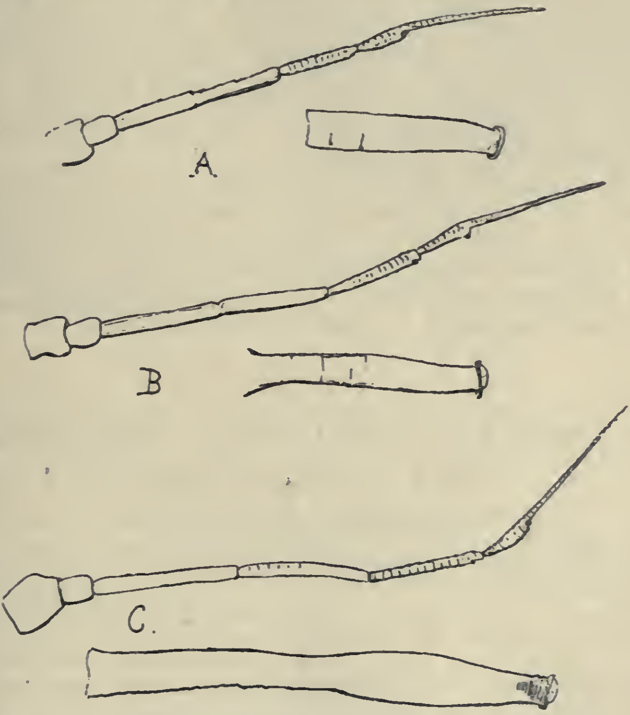

Fig. II.—Antennæ and cornicles of *Rhopalosiphum solani*, Kalt.
A. Pink larva. B. Pink nymph. C. Green apterous female.

Wings normal, with brown stigma. Venter yellowish green to green, mesosternum black. Some specimens have the ground colour almost all yellow. The proboscis appears to be banded with narrow, dusky, and pale areas. The abdomen much darker than in *dianthi*.

Apterous female.—Variable in colour: bright apple-green, dull green, and pinkish, shiny. Three forms occur, as follows:—

a. Pale green to yellowish green; antennæ pale green, dark on the apical halves; cornicles green, with small dark apical areas. Legs green, apex of tibiæ and tarsi dark. Eyes reddish black; cauda green, tips of the cornicles nearly level with its end.

β. Bright apple-green; head dark; eyes reddish brown; two basal segments of antennæ dark, the third pale at the base, remainder dark; cornicles dusky, projecting a little beyond the tip of the dark caudal process. Legs dusky green, darker at the apices. Proboscis pale green, dark at the apex, reaching just past the base of the second pair of legs.

γ. Pale pink, with occasional ochreous areas.

In all the cornicles have marked transverse lines, and the third segment of the antennæ is longer than the fourth, the fourth slightly longer than the fifth, the sixth about equal to the fourth and fifth. Caudal process much as in the alate female (Fig. I., B).

Nymph.—All pale yellowish green or pinkish to yellowish brown. In some the head is pinkish, the thorax dull yellowish, and the abdomen pinkish. Wing-buds dusky at the apices and sides. Legs pale dusky at their apices; antennæ pale, dark on the apical half; cornicles pale, dark at their tips.

I have retained Kaltenbach's name for this potato aphis, although it certainly approaches Schrank's *dianthi*. The sensoria on the third antennal segment of the alate female nearly agree with one another, but the general appearance of the insects differ, and also the thoracic and abdominal markings. Moreover, I could not get it to breed on peach or nectarine.

NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. Wileman, F.E.S.

Urapteryx inspersa, sp. n.

♂. Fore wings white, heavily freckled and striated with greyish; antemedial and postmedial lines broad, brownish grey, oblique, the former nearer to the latter on dorsum than on costa; narrow spaces before the antemedial and beyond the postmedial lines free of freckling; discoidal mark linear, inconspicuous. Hind wings white freckled with greyish on terminal area; medial line broad, brownish grey, straight, not extending to costa or to dorsum; a black mark on each side of vein four before the tail, the upper one scarlet mixed. Fringes of all the wings pale brown, terminal line on the hind wings reddish brown. Under side white, transverse markings of upper side faintly indicated.

Expanse, 53 millim.

Collection number, 1545*a*.

Two male specimens from Rantaizan, May 9th and 14th, 1909.

In the cotype the upper mark before the tail is more scarlet than black.

Urapteryx approximaria, sp. n.

♂. Fore wings white, faint brownish striæ on costa; antemedial and postmedial lines pale brown, oblique, approaching towards dorsum; discoidal mark brownish, linear; fringes pale brown, darker at apex, whitish at tornus. Hind wings white, faint brownish striæ on terminal area; medial line brownish, straight; a brownish cloud edged with black at base of tail; fringes red-brown, whitish at tornus. Under side white; two dusky transverse lines on fore wings.

Expanse, 52 millim.

Collection number, 1546.

A male specimen from Kanshirei, April 21st, 1908.

Obedia octoscripta, sp. n.

♂. Fore wings yellow, white on basal two-thirds of dorsum; basal third with three transverse series of black spots; two large 8-shaped black marks on costal portion of medial area; a postmedial series of nine black spots, four to six smallest, seven and eight largest, the latter placed inwards and rather out of line with the others of series; a subterminal series of seven black spots, the second double; terminal line black; fringes yellow chequered with black. Hind wings white, black spots towards base, terminal third yellow, traversed by two series of black spots. Under side as above.

Expanse, 46 millim.

Collection number, 1572.

A male, Arizan, August 14th, 1908.

Comes near *O. largetaui*, Ob.

Eucherodes agnes subalba, ab. nov.

♀. Fore wings white, dark markings broken up and intersected by the ground colour. Hind wings white; medial line dusky, diffuse, excurved from costa to vein four, thence incurved to dorsum. Under side white, veins brownish; fore wings ochreous brown on the costa, a brownish cloud in the cell, and a brownish spot at outer end of the cell; medial line blackish, sinuous, united with a brownish cloud near the costa; medial line of hind wings brownish, double, united below the middle; discoidal spot and traces of subterminal band brownish.

Expanse, 60 millim.

Collection number, 1551.

A female specimen from Arizan (7300 ft.), August 8th, 1908.

Glaucopteryx latifasciata, sp. n.

♂. Fore wings greyish brown, clouded and striated with darker; basal area reddish brown, limited by two curved black lines enclosing a diffuse dusky line; central fascia brown outwardly clouded with blackish, narrowed towards dorsum, the outer dentated edge outlined in white and followed by a reddish brown band enclosing an interrupted black line, the inner edge indented above dorsum, bordered by a reddish brown double line; subterminal line pale, wavy, only distinct towards dorsum, where the terminal area is suffused with blackish; the veins on terminal area reddish brown, a black mark below apex. Hind wings pale brown, almost whitish; faint traces of a dusky postmedial line and a subterminal band. Under side pale brown, irrorated with darker brown; a blackish discal dot and an irregular postmedial line on all the wings, the area within the postmedial line suffused with dusky.

Expanse, 40 millim.

Collection number, 1581*a*.

Two male specimens from Arizan (7300 ft.), August 8th, 1908.

Lygris convexa, sp. n.

♂. Head and thorax white marked with blackish, metathorax and palpi tipped with tawny; abdomen white, four black dots on basal segments, anal segment blackish. Fore wings white, with four bands, formed of blackish lines, running from costa to just above tornus, where they are edged with tawny; the first and second of the four lines forming the subbasal band only run to just beyond the middle of dorsum; the antemedial and postmedial bands, each of three lines, curve round one into the other above tornus; the first of the three lines forming subterminal band joins the postmedial at about middle, but the other two lines are not extended beyond this point; a brownish oblique streak before the antemedial band, and a small blackish spot above dorsum towards tornus. Hind wings white, tornal half of outer area tawny, enclosing dark greyish edged white spots, and limited above by dark grey wavy lines. Under side white; a black discoidal spot, elbowed postmedial, and interrupted subterminal bands on forewings.

Expanse, 50 millim.

Collection number, 1562.

One male specimen from Kanshirei (1000 ft.).

Allied to *L. ludovicaria*, Oberthür.

Lygris basistrigaria, sp. n.

♂. Head and thorax white marked with grey-brown; abdomen white, inclining to ochreous posteriorly, barred with grey-brown. Fore wings white; basal and antemedial oblique bands grey-brown, broad, enclosing lines and streaks of the ground colour (the basal half of the wing might be described as grey-brown transversely, streaked with white); postmedial band grey-brown, slightly excurved between veins four and two, tapered towards dorsum, enclosing a white line towards costa; subterminal band represented by three grey-brown lines, the first two united above tornus, the third short; a grey-brown line, broken up into spots towards tornus, before the blackish terminal line; tornal area of outer margin ochreous. Hind wings white, inclining to pale ochreous on outer margin; discoidal spot grey-brown; an ochreous patch, with obscure blackish spots on it, above tornus; three blackish spots on termen about middle. Under side white; all the wings have blackish discoidal spot, postmedial band, interrupted subterminal band, and mark above middle of termen; the hind wings are marked with ochreous above tornus.

Expanse, 46 millim.

Collection number, 1563.

A male specimen from Kanshirei, May 7th, 1908.

Allied to *L. constrica*, Warren, from China.

BRITISH ODONATA IN 1911.

By W. J. Lucas, B.A., F.E.S.

(Concluded from p. 144.)

On August 10th Col. J. W. Yerbury sent me a few dragonflies from the North of Scotland. A male *C. annulatus*, Nethy Bridge, August 6th; two males, *Æschna juncea*, Nethy Bridge, August 6th and 7th; one male *L. quadrimaculata*, Nethy Bridge, August 7th; one male *Sympetrum scoticum*, Nethy Bridge, August 7th; one male *S. scoticum*, Spey Bridge, August 8th; and three females, *Lestes sponsa*, Aviemore, August 10th. For experiment, the three *L. sponsa* were despatched while still alive in small tubes. Unfortunately they had to be readdressed to me from Kingston to the New Forest. Two arrived dead, but the third was quite alive, notwithstanding the length of time on the journey.

On his return south the same entomologist gave me a most interesting little collection of dragonflies he had taken during his summer visit to the North of Scotland. Amongst them was a pair of insects belonging to the genus *Sympetrum*, which are either new or else constitute a very distinct race of *S. striolatum*. In 1900 (*vide* Entom. vol. xxxiii. p. 139) I called attention to and figured details of a dragonfly, one of two females brought by Mr. H. S. Fremlin from Stornoway in 1899. There was some doubt about their identity, and Mr. McLachlan seemed to think the specimens might be hybrids between *S. striolatum* and *S. scoticum*. Though a very unsatisfactory conclusion, it was left at this. Now Col. Yerbury has captured a pair at Lochinver (June 24th and July 7th, 1911), in Ross, the very counterpart of the two females from Stornoway. These I describe as *Sympetrum nigrescens*:—

Description.—Vertex ochreous; anterior to it a rather broad black band, extending to some extent downwards along the side of the eyes as in *S. vulgatum*. Rest of face ochreous, rhinarium and neighbourhood being rather lighter; hairs black. On the mesonotum two distinct narrow longitudinal yellowish streaks. Ground colour of sides of thorax nearly black, with two large bright yellow oblong spots; between these four small ones, and below them, three others, all bright yellow; under surface of thorax very dark, with bright yellowish markings. The thorax recalls very strongly that of *S. scoticum*. Wing-nervures black; pterostigma as in *S. striolatum*. Fore legs black, with femur somewhat ochreous below; mid and hind legs black; all legs with a fine ochreous line along the tibia. Abdomen blackish below; ridges outlined in black; two black dorsal dots on several of the segments. In the female there are, in addition, strong black lateral lines on the segments of the abdomen. Genitalia much as in *S. striolatum*. In the male the internal hamular branch perhaps a little more blunt and the external one a little sharper and more distinct. The margin of the vulvar scale nearly straight, barely hollowed. Size between that of normal *S. striolatum* and *S. scoticum*. General appearance so distinct from normal *S. striolatum* that one was relaxed, set, and put in the cabinet with *S. scoticum* before the difference was noticed in size and pterostigma.

Other specimens were:—*S. scoticum*, a female, Nethy Bridge, August 11th. *L. quadrimaculata*, a male, Inchnadamph, Loch Assynt, June 2nd; a female, Inchnadamph, Loch Assynt, no date; a male, Loch Assynt, June 8th. *C. annulatus*, a female, Loch Assynt, June 6th. *Æschna cœrulea*, a male, Loch Assynt, June 6th; a female, Loch Assynt, June 3rd—a new locality for this scarce and interesting species. *Æ. juncea*, a male, Nethy Bridge, September 4th. *L. sponsa*, a male, Lochinver, July 9th. *P. nymphula*, two females, Inchnadamph, June 1st; two males, Loch Assynt, June 10th and 12th; a male, Lochinver, June 23rd; a male and a female, *in cop.*, Lochinver, July 9th; a female, Nethy Bridge, July 28th. *I. elegans*, a male, and a nice female var. *rufescens*, June 20th; a male, July 1st; a male, July 9th; and a male, July 16th—all at Lochinver. *E. cyathigerum*, a male, June 20th; three males, June 21st; a male and a female, *in cop.*, June 23rd; a female, June 24th. In addition, there were the following nymphs or skins:—One *C. annulatus*, apparently immature, picked up on the shore of Loch Assynt, June 13th; one *C. annulatus*, Lochinver, June 28th or 29th, found alongside a freshly emerged male imago; one *C. annulatus*, Lochinver, June 27th, on trunk of alder, banks of Inver; one *E. cyathigerum*, Lochinver, July 11th, apparently the nymph-skin from which emerged a very teneral female sent with it.

Writing from Nethy Bridge, August 22nd, Mr. J. J. F. X. King said of *Agrion hastulatum* that, though he met with the males in fair numbers, he found the females scarce, at their habitat at Aviemore. The species is on the wing only for a short time, hence the difficulty in obtaining specimens.

In addition to the examples of *S. fonscolombii* previously mentioned, Lieut.-Col. Nurse showed me other dragonflies taken in the East of England in 1911. *Brachytron pratense*, two males, Chippenham, Cambridgeshire, May 21st and June 16th. *Æschna cyanea*, a male, Stowmarket, Suffolk, August 2nd. *P. nymphula*, five males, Chippenham, May 17th. *I. elegans*, a female, Wicken Fen, Cambridge, May 28th; and a female, Chippenham, June 16th. *Agrion puella*, two females, Ampton, West Suffolk, May 18th and August 13th.

Mr. G. O. Sloper sent me from Oughterard, co. Galway, Ireland, a male and a female of *Æ. juncea*, taken on September 11th, 1911.

Writing on November 22nd, Mr. N. P. Fenwick, Jun., gave a few notes on his doings amongst the Odonata during the year. He said:—“This year I first saw *Æ. grandis* on July 8th, when

I took two males on the River Mole. *Platycnemis pennipes* has been very scarce there this year; but one or two *Erythromma naias* were about at the beginning of July. On July 24th I saw a large *Æschna*, which I am pretty sure was *grandis*, hawking up and down amongst the motor-buses in Cornhill. On the previous day I saw on the Mole an *Æ. grandis* pounce on a *Pieris rapæ* which happened to fly near. It quickly bit off the wings of the butterfly and departed with the body in its mouth. During the latter half of August and September I was shooting in Achill Island, co. Mayo, and was surprised to find that the Odonata there were chiefly conspicuous by their absence. However, one or two *S. striolatum* were to be seen, and also an occasional *I. elegans*. The weather was not good, and this may account for their scarcity to a certain extent."

Though the fine weather continued into the autumn, late records for dragonflies were disappointing. On October 1st, near Bedford, I saw one example, which was no doubt *S. striolatum*, while at the Black Pond, Surrey, on Oct. 28th, I watched a few which, with still less doubt, belonged to that species. These were the last I saw. Mr. G. T. Lyle, however, found that species common in the New Forest on November 5th. Miss A. Sharp tells me that on November 1st she saw a big one in the New Forest, but could not name it. Assuming it to have been an *Æschna*, a certain record of it would have been very interesting.

Kingston-on-Thames: March, 1912.

NOTES ON THE DRAGONFLY SEASON OF 1911.

By F. W. and H. Campion.

Notwithstanding the long and brilliant summer of 1911, dragonflies did not seem to be particularly abundant on the few occasions when we had opportunities for observing them. However, twenty-four species were met with during the season by ourselves or by our fellow collector, Mr. H. J. Watts, and a certain number of the captures made seem to be worthy of mention.

On August 14th Mr. Watts showed us a male of *Sympetrum flaveolum* which he had taken the day before at Wisley, Surrey. We visited the same pond ourselves on August 26th, and took two more males, all the specimens which were seen. Again at Wisley, on August 20th, Mr. Watts obtained a female of *S. danæ*, Sulz. (= *S. scoticum*, Don.) exhibiting a very interesting malformation. The tips of both fore wings presented the appearance of a piece of soft paper which had been twisted into a screw between the thumb and forefinger, and the abnormal condition was no doubt due to incomplete inflation of the wings, through one cause or another, at the time when the nymph was transforming into the imago. It is probable that, if the insect had lived for some time longer, the twisted tips would have fallen away, and the wings would have assumed the abbreviated form with rounded apex which is met with occasionally, as an individual peculiarity, in different species of Anisoptera. In the present case the right wing is affected to a greater extent than the left, the entire area lying beyond the nodus being malformed. Mature and immature specimens of *S. sanguineum* were taken at Ramsey, Hunts, on July 8th, and the species was flying in great numbers at Wisley on August 26th.

A male of *Cordulia ænea* occurred to Mr. Watts at Byfleet on May 21st, and a female was taken by ourselves near the Black Pond on June 16th. Search was made for *Somatochlora metallica* in Surrey, where it occurred in 1910, but no specimens were procured.

Mr. Watts informs us that he took an emerging imago of *Brachytron hafniense* at Byfleet on May 21st, and found the species plentiful at Wisley on May 28th. A male of *Æschna mixta* was caught at Wisley on August 20th (H. J. Watts). Between, and including, September 3rd and 10th Mr. J. C. Ashby found *mixta* in abundance at Hunton, near Yalding, Kent, and he showed us several specimens which he had taken.

Libellula depressa, *Orthetrum cærulescens*, *Calopteryx virgo*, *Pyrrhosoma tenellum*, and *Agrion mercuriale* were among the species taken at Brockenhurst, in the New Forest, on June 11th (H. J. Watts). At the same time and place a male imago of *Æschna cyanea* was obtained with the nymph-skin from which it had just escaped. This is the earliest emergence of the species known to us. A female *cyanea* was taken by ourselves at Ramsey on July 8th. On July 11th, an unusually early date, Mr. Watts found *Æ. grandis* already on the wing at Ely.

The same observer noted *Calopteryx splendens* at Wisley (May 28th and July 23rd); Silverton, on the River Exe (June 4th); Arundel (July 9th); and Ely (July 11th).

A few adult males of *Lestes dryas* were taken near Ramsey, Hunts, on July 8th. In consequence of information kindly furnished to us by Mr. S. W. Kemp, we were able to identify the ponds near Hanwell, Middlesex, where in 1902 he discovered a large colony of this interesting species. We found that we knew the ponds already, and had examined them for Odonata in 1910. We paid several further visits to the place in 1911, but no trace of the species could be found in either year. Mr. E. A. Waterhouse has been so good as to give us specimens of *dryas* taken by himself at the ponds in question on July 17th, 1902, in company with Mr. Kemp, and further (teneral) examples obtained there on June 26th, 1903. Mr. Waterhouse tells us that he has not seen the insect since 1903, although he has been to the ponds again for water-beetles on several occasions, and as recently as 1909.

According to Mr. Watts' observations, *Erythromma naias* had a very long season, for he took his first specimen (a female) at Byfleet on May 21st, and his last (two males at Wisley) on the exceptionally late date August 20th. *Pyrrhosoma tenellum* was found at the Black Pond on June 16th, 18th, and 20th, but the specimens obtained were rather immature. The species was met with there, also, on August 24th and 27th. Again, at the Black Pond (June 20th), a number of males of *Enallagma cyathigerum* were flying over grass, and one of them was seen to be carrying prey. It was captured, but was unfortunately allowed to escape, although it left its victim behind it in the net. Mr. R. South was kind enough to examine the prey, and identified it as the Pyralid moth *Scoparia ambigualis.* Another male of *E. cyathigerum* with prey was taken at the same place on June 18th; in this instance the dragonfly was feeding on the common little moth *Tortrix viridana.*

The capture of *Erythromma naias, Ischnura elegans,* and *Enallagma cyathigerum* near Ruislip, Middlesex, on May 28th, may be recorded for the sake of the locality. For the same reason, also, we may mention the following species taken on the Grand Junction Canal in the Uxbridge district:—*Calopteryx splendens*, male and female (June 4th), *Pyrrhosoma nymphula* (June 4th), *Ischnura elegans* (June 4th and 11th), and *Agrion puella* (June 11th). On the later date named our captures of *I. elegans* included immature as well as mature specimens, and var. female *rufescens* was also taken. Many of the females had the abdomen smeared with mud, as though they had been ovipositing. A visit to Lechlade, Glos., on September 1st (H. J. Watts) resulted in the capture of *S. striolatum*, *Æ. grandis*, and *E. cyathigerum.*

58, Ranelagh Road, Ealing: April 13th, 1912.

NEW AND LITTLE-KNOWN BEES.

By T. D. A. Cockerell.

Megachile aricensis, Friese.

Piura, Peru, March, 1911, and April 28th, 1911, at flowers of *Philibertella flava* (Meyer), Cockerell; two males collected by C. H. T. Townsend. New to Peru. The *Philibertella* was recorded somewhat doubtfully in Ann. Mag. Nat. Hist., August, 1911, p. 285; I sent the specimen to Dr. N. L. Britton, who expresses the opinion that my identification is correct.

Megachile philinca, sp. n.

♀. Length, 10 mm., rather slender; black, with the legs bright ferruginous, the under side of the abdomen also ferruginous, as also the extreme lateral margins of the dorsal segments, especially posteriorly; eyes brown; mandibles red, quadridentate, the teeth black; cheeks narrow, especially above; clypeus and supraclypeal area shining, with strong punctures; cheeks, base of mandibles, and sides of clypeus with white hair, that on clypeus directed inwards, the ends meeting in the middle; a few inconspicuous black hairs about upper part of clypeus and middle of face; hair of front and sides of face pale yellowish, of vertex and occiput black, a strong black tuft between the ocelli; antennæ black, the flagellum with the faintest reddish tinge beneath; mesothorax dullish, with strong scattered punctures, bordered all round (broadly in front) with dense orange tomentum, the greater part, however, apparently bare, but with thin black hair; scutellum with long black hair, but posteriorly, and on postscutellum it is very pale yellowish to white; hair on pleura, sides of prothorax and metathorax white, but a black tuft just beyond tubercles; tegulæ shining apricot colour; wings dusky hyaline, nervures dark fuscous; legs with white hair, pale orange on inner side of tarsi; abdomen above shining black, with strong green and purple tints, hind margins of the segments with entire but narrow pale yellowish hair-bands; ventral scopa white, black on last segment.

♂. Length about 8½ mm.; differing by the usual sexual characters; face densely covered with silky pale golden hair; black hairs of hind part of head above, and of scutellum, very long; mandibles very dark, nearly black; antennæ black, last joint not peculiar; a curious long pencil of black hair on lower part of cheeks; anterior coxæ unarmed; anterior femora rather broad and flat, anterior tarsi not modified; fifth and sixth abdominal segments with pale yellowish hair and longer black hair; sixth segment retracted, feebly emarginate.

Hab.—Piura, Peru, February, 1911; one female, three males taken from nest (C. H. T. Townsend, 1124). The cells are covered with leaves in the usual manner, and the whole has a diameter of about 8 mm. The bee has taken portions of small leaves, each showing a midrib. A neat little species, quite closely related (male) to *M. lenticula*, Vachal, but the latter is larger, with black legs, and a very long pale yellow beard on cheeks below, the cheeks of *philinca* having a very short white beard. The type of *philinca* is the female. I have sent a male *M. philinca* to the British Museum.

TRICHOCOLLETES, gen. nov.

Resembling *Paracolletes*, but the eyes clothed with very long hair; stigma rudimentary.

Type, *Trichocolletes venustus* (*Lamprocolletes venustus*, F. Smith).

A specimen from Victoria, Sept. 20th, 1901 (W. W. Froggatt, 67), was observed to agree with *L. venustus*, except that it was larger (length fully 12 mm.), and, to my astonishment, the eyes were covered with long hair. I wrote to Mr. G. Meade-Waldo, asking him to look at Smith's type, and received this reply:—"I have carefully examined *L. venustus*, Sm., and find the eyes are clothed with long pale hair! Smith's estimate of length (4½ l.) is not far out for the type specimen in its present position with abdomen somewhat curved; I would suggest 11½ mm. as a fair estimate of the total length, if the abdomen were straight." There is therefore no doubt that the specimen from Victoria is really *L. venustus*, which should, I think, form the type of a new genus.

Paracolletes turneri, Cockerell.

The known range is greatly extended by a specimen from Rutherglen, Victoria, 1909 (French; Froggatt collection, 86). Mr. Meade-Waldo has kindly examined the types of *P. turneri* and *P. elegans* (Sm.), and notes that in *P. turneri* the post-scutellum is armed medially with a small tooth-like process (so also in the specimen from Victoria), but in *P. elegans* the post-scutellum is shining, entirely impunctate, and bluntly subtuberculate.

Xenoglossa citrullina, sp. n.

♂. Length about 10 mm., antennæ about 7; black, head and thorax with very pale grey hair, vertex with some long fuscous hairs curving over ocelli, middle of scutellum and hind part of disc of mesothorax with dark sooty hair; nearly the lower half of clypeus yellow, the upper edge of the yellow angled in middle; labrum yellow; mandibles black, obscurely reddish toward apex; antennæ black, the flagellum very obscurely reddish beneath, its apical half strongly crenulated; maxillary palpi five-jointed, the last four joints measuring in μ (2.) 192, (3.) 192, (4.) 65, (5.) 110; paraglossæ extending beyond blade of maxilla, and the latter a little beyond end of second joint of labial palpi; last joint of labial palpi broad and obliquely truncate at end; tongue extending about 1088 μ beyond paraglossæ; mesothorax dullish, with evident shallow punctures; tegulæ rufopiceous, with some dark sooty hair; wings moderately dusky; b. n. falling short of t. m.; small joints of tarsi ferruginous; hair on inner side of tarsi bright fox-red; abdomen very distinctly punctured; second segment with a pale basal hair-band, evanescent in middle; segments three to five with dense subapical bands of very pale yellowish-grey tomentum; sixth with redder hair, which covers apical margin; apical plate ferruginous, broadly truncate; no lateral spines.

Hab.—Piura, Peru, at flowers of water-melon, May (C. H. T. Townsend). It had previously visited an Asclepiad, as shown by two pollen-masses on the legs. This is related to the North American *Xenoglossa pruinosa*, Say, but differs in the maxillary palpi, which rather resemble those of *Tetralonia leucocephala*, Bertoni and Schrottky. The subapical hair-band, conspicuous on the second abdominal segment of *X. pruinosa*, is wholly absent in *X. citrullina*, which also has the antennæ unusually long for a *Xenoglossa*.

Boulder, Colorado: March 8th, 1912.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief Gervase F. Mathew, R.N., F.E.S., &c.

(Continued from p. 155.)

June 12th was fine and hot, and I spent most of the day in the woods, but did not secure anything of note. *Parasemia (Nemeophila) plantaginis* was kicked up in small numbers: also *Euclidia glyphica*, *E. mi*, and *Hapalotis fasciana* (*Erastria fuscula*). The leaves of the butter-bur had been riddled by the larvæ of *Aciptilia galactodactyla*, but although I turned over scores of them I only found two pupæ. Among St. John's wort the pretty little *Catoptria hypericana* was flying in some numbers, and the larvæ of *Depressaria hypericella* were plentiful in screwed-up leaves and terminal shoots. The first *T. costana* was bred to-day from the pupæ and larvæ taken on the 8th.

The 13th and 14th were rather cool days with occasional showers. On the 13th I beat some fine fresh *Endopisa nebritana* from sloe and bramble; on the 14th more pupæ and larvæ of *T. costana* were found, and *Melanthia procellata* was beaten from wild clematis; on the 15th I returned to Dovercourt. On the 17th there had been some rain during the night, followed by a warm bright day with a fresh south-westerly breeze. I visited the woods in the evening and tried sugar; it was (apparently) a very favourable night, but only one moth was attracted, a large and very dark—almost black—*Palimpsestis* (*Cymatophora*) *duplaris*. I had hoped that the previous night's rain would have washed off most of the honeydew, but it had not. Very few things were flying at dusk, the only thing netted being *Noctua festiva*. Several *Hypena proboscidalis* were bred. On the 18th *Acidalia marginipuncta* was bred from a brood of larvæ I got through the winter; one larva was still feeding. A very dark, almost black, variety of *T. costana* was bred from Castor pupæ; it is a very pretty insect—I have not seen one like it before. The 20th was fine, with heavy showers in the middle of the day; warm south-westerly breeze. In a marshy field, below a small wood, where there were some ditches overgrown with reeds, I tied several reeds together and sugared them. Moths came in abundance, and among others were the following:—*Leucania obsoleta* (one, rather worn); *L. comma*, *Apamea basilinea*, *Hadena dentina*, *H. suasa*, *Euplexia lucipara*, *Noctua augur*, *Triphæna* *pronuba*, *Agrotis exclamationis*, *A. gemina*, *Miana fasciuncula*, *M. strigilis*, and *H. oleracea*, were abundant. Several fresh *Leucania pallens* were sitting on the reeds drying their wings. In the forenoon I took a fresh *Trochilium apiformis* on a poplar-tree. On the 21st I sugared in another locality—a dark warm night with no dew or moon. Moths were abundant, from sixteen to twenty on every patch of sugar; all those species seen the previous night were present, with the exception of *L. obsoleta* and *H. dentina*, and, in addition, I boxed five *L. favicolor* (an insect I had not seen for several years), *Agrotis ripæ* (already worn), *Mamestra sordida* (*anceps*), *L. impura*, *Mania typica*, *Caradrina morpheus*, *N. c-nigrum*, and *Acronycta psi*, or *tridens*; the latter were abundant. The 23rd was fine and warm until 4 p.m., when a drizzly rain set in until 7 o'clock, then it cleared for a short time. In the forenoon I took one *T. apiformis* from poplar, and several *Hedya neglectana.* In the evening I armed myself with an umbrella and went to the lanes, &c., "sugaring." Fine rain came on again, and by 10 o'clock it had increased to a regular downpour. However, moths were quite numerous, and I got five more *L. favicolor*, and saw all the species noted on the 21st, with the addition of *Xylophasia lithoxylea*, *Aplecta advena*, and *Axylia putris*. On the 26th I bred *Melanthia albicillata*, and beat about three dozen larvæ of *Anticlea badiata*, most of them full grown. Larvæ of *Malacosoma neustria* were now abundant. When at Castor I obtained a batch of ova of *Ematurga atomaria*, which began to hatch on the 27th. I supplied them with white clover, *Lotus corniculatus*, and knotgrass; they nibbled at each, but finally settled down to the knotgrass, at which I was pleased, as this is the easiest plant of the three to keep fresh. (They eventually became full-grown, and very pretty larvæ they were; I thought the moths would emerge in the late summer, but they did not do so.) I went to the woods in the forenoon on the 27th, but the weather was rather dull, and insects were not moving. I got another *T. apiformis* and one *Crambus pinetellus*, which is rather uncommon here. I sugared in the lanes, &c., in the evening, and there were plenty of visitors on each patch; I boxed three *L. favicolor*, and, in addition to the species already seen, noticed *Acronycta megacephala*, *L. lithargyria*, and *N. plecta*. The 28th was fine and bright in the morning, but clouded over during the afternoon, with warm light north-westerly breezes. In the woods, notwithstanding the warm dark night, very few moths were flying, and only seven visited the sugar, *Palimpsestis* (*Cymatophora*) *or* being the best. The 29th was dull and warm. I took a pair of *T. apiformis* in cop, high up on a poplar at 9 a.m. The female laid a quantity of little round, shining, chocolate-coloured eggs, with apparently no adhesive matter attached to them, as they rolled loosely about in the box. I wonder where the eggs are placed by this female? Probably in the old larva-holes, or scattered at random at the base of the tree. *Hadena trifolii* (*chenopodii*) and *Pseudoterpna pruinata* (*cytisaria*) were now emerging in breeding-cages. The 30th was another dull warm day. *Thecla quercus* and *Triphæna ianthina* were bred.

On July 1st we had sun and cloud, light westerly breezes, and it was very warm. Posts, &c., near the sea, were sugared. It seemed to be a favourable night, but moths were few and far between. Among those seen or taken were two *Leucania favicolor* and six or seven *Agrotis ripæ*, all much worn; *Mamestra abjecta*, two very fine, the first this year; and I was sorry to see *X. polyodon*, as I knew this species would probably be a pest in a few days. A couple of *Crambus salinellus* were netted at dusk. The 4th was fine and bright, and very warm. Two more *Trochilium apiformis* were taken off poplars after breakfast. In the evening I sugared on the marshes; moths were not very numerous, but *L. conigera* and *M. albicolon* were observed for the first time. At dusk eight *C. salinellus*, all males, were netted, together with *Lithosia complana* and *Acidalia emutaria*. The 5th was another hot day. Some *T. interjecta* were bred. One of the female *L. favicolor* taken on June 21st had laid a few eggs, and they began to hatch to-day.

The 6th was fine, bright, and very hot, the warmest day we have yet had. I went to the salterns to see if I could get any full-grown larvæ of *Malacosoma castrensis*, but in consequence of the dry weather and scarcity of grass I found the farmers had turned their cattle out there; everything had been cropped close to the ground, and there was hardly an insect to be seen. There were no signs of *castrensis* larvæ. I was perhaps a bit too late for them. All I got was one specimen of *A. emutaria* and half a dozen *Tortrix viburniana*. On the way back I noticed a quantity of chamomile growing at the edge of a cornfield, and upon sweeping it with my net obtained seven small larvæ of *Cucullia chamomillæ* and a number of *Eupithecia oblongata*. *Epinephele tithonus* was just appearing.

The 7th was fine and very hot. A large female *Zeuzera æsculi* was brought to me by a boy; *C. asteris*, *E. subnotata*, and *T. fimbria* appeared in breeding-cages. In the evening I went to the marshes, to work along the reeds. There was a light easterly breeze; a heavy dew and a ground-fog began to rise, and it became quite cool, which stopped the flight. I only got *Comacla* (*Nudaria*) *senex*, *Chilo phragmitellus*, and *Acidalia emarginata* (the latter had been abundant in some places), so I left the marshes and went homewards. When I reached the higher ground I lost the fog and it became much warmer, and common insects such as *Timandra amataria*, *Camptogramma bilineata*, *Cidaria dotata*, *Hypena proboscidalis*, &c., were flying in great numbers.

(To be continued.)

NOTES AND OBSERVATIONS.

A NEW GENERIC NAME IN THE HEMITHEINÆ.—I regret that by an unaccountable oversight I overlooked the name *Orthocraspeda* in Hampson's *Fauna of British India : Moths*, 1, p. 393, and have employed the same name again in my recent revision of the Geometrid subfamily Hemitheinæ (Gen. Ins. fasc. 129, p. 28, 1912). For *Orthocraspeda*, Prout, nec Hampson (type *netunaria*, Guen.) I therefore propose the new name of *Orthorisma*.—LOUIS B. PROUT; 62, Graham Road, N.E., May 3rd, 1912.

PLUSIA MONETA.—Is it known how *P. moneta* passes the winter? I am inclined to think that the egg is laid on the seed of the plant while in the pod. For this reason: last autumn I bought some new flower-pots from a brick-yard, not from a nurseryman, one of which I filled with earth from a meadow far from any possible *Delphinium* or monkshood, and in it planted some seeds of *Delphinium* bought from a seedsman. This pot was kept in a greenhouse through the winter, in which there were not and had not been any other *Delphinium* plants. When my seedlings were about an inch and a half high, there, curled up among them, was a small *P. moneta* larva. How did it get there? The only possible way seems to be that it was among the seed, either as ovum or larva, and all things considered it does not seem feasible that it could have survived if it was in the larval stage. Hence I conclude that the egg is attached to a seed and so passes the winter.—W. CLAXTON; Navestock Vicarage, Romford.

GYNANDROUS EUCHLOE CARDAMINES.—It may be of interest to record the capture of a gynandrous specimen of *E. cardamines* at Oxshott, on May 12th. The left side is female and the right side male. The orange has a splash of white through it on both upper and under side of the wing. There is also a black streak radiating from the tip of the wing towards the centre.—D. S. WILLIAMS; 77, Durham Road, East Finchley, N., May 13th, 1912.

BREPHOS PARTHENIAS, ab.—On March 23rd, 1912, I took, on Wimbledon Common, several *B. parthenias*, all in very fine condition; one of these has the whole ground colour of the hind wings pure yellow, with the usual blackish markings. Seeing that you state that this form of *B. parthenias* is rare ('Moths of the British Isles,' Series ii. p. 98), I thought it might be well to record the capture.—W. SAVILLE; 16, Mincing Lane, E.C., April 25th, 1912.

DRYMONIA CHAONIA, ab.—On the evening of May 7th I took a specimen of *D. chaonia* on a street lamp. It is without the usual white band, and of a uniform dark sooty colour.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere.

COLIAS EDUSA AT REIGATE.—A specimen of *C. edusa* was flying in my garden this morning (May 12th) at 10 a.m. It went straight across in the usual manner of the species. I have heard of another specimen being seen.—T. A. CHAPMAN; "Betula," Reigate, May 16th, 1912.

Colias edusa in the Isle of Wight.—I am glad to record the capture of a perfectly fresh female *C. edusa*, which I took on Culver Cliffs at Sandown to-day (May 14th). There does not appear to be any record of this species having been taken before, in the spring, in any part of the Isle of Wight.—Stanley A. Blenkarn, F.E.S.; "Teneriffe," Sandown, 1912.

Euchloë cardamines in April.—Dr. R. N. Goodman (Kingston) informs me that he saw a specimen of *E. cardamines* on April 13th last. I may add that I saw a specimen of this butterfly at Claygate Coverts on April 24th.—W. J. Lucas.

Lycænopsis (Cyaniris) argiolus, Linn., in April.—It is interesting to note that this species, which was first observed here in 1899, seems firmly established, as to-day I have seen several freshly emerged specimens flying in the sunshine. By this early date of appearance there can be no doubt that they have hybernated in the pupal stage.—Hamilton H. Druce; The Beeches, Circus Road, London, N.W., April 18th, 1912.

I took a specimen of *argiolus* in my garden at Kelly College, on Good Friday, April 5th. — H. V. Plum; Kelly College, Tavistock, May 8th, 1912.

Pyrameis atalanta and P. cardui at Dover.—A pupil (J. P. Restall) informs me that *P. atalanta* and *P. cardui* are swarming at Dover. I may add that I saw a specimen of the last-named species at Claygate on May 12th last. — E. A. C. Stowell; Kingston Grammar School, Kingston-on-Thames, May 17th, 1912.

Pyrameis atalanta at Haslemere.—On May 12th I saw a fine specimen of *P. atalanta* flying about a bed of nettles. It appeared to be in good condition.—Bertram E. Jupp; Lyn Lodge, Camelsdale, Haslemere.

Pyrameis atalanta and P. cardui in Isle of Wight.—*P. cardui* was common at Sandown on May 14th, and the specimens were in fine condition. One very fresh specimen of *P. atalanta* was noted.—Stanley A. Blenkarn; "Norham," Cromwell Road, Beckenham.

Pyrameis cardui and Nomophila noctuella at Kew.—In Kew Gardens, on May 14th, I saw two specimens, both seen at once, of *P. cardui;* also one example of *N. noctuella*, clearly pointing to a spring immigration.—T. A. Chapman; "Betula," Reigate.

Pyrameis cardui in Norfolk.—On May 14th last I captured in Roughton Rectory Garden, near Cromer, a specimen of *P. cardui*. It was not at all worn.—L. W. Robinson; Roughton Rectory, Norwich.

Manduca (Acherontia) atropos in Salop. — A specimen of *M. atropos* was brought to me, on May 15th, by a working man in Shifnal. The moth had entered one of his hives and driven every bee out, queen included. I note that *Macroglossa stellatarum* is also about. These facts point to a migrant year. A full-grown larva of *Gastropacha quercifolia* was sent to me from a garden in Welford-on-Avon.—L. T. Burt; Buckley Estate Office, near Shifnal, Salop.

PHRYXUS (DEILEPHILA) LIVORNICA AT DOVER.—I am pleased to record the capture of *P. livornica* on May 17th, 1912, on the Admiralty Pier, Dover, by a Mr. E. King. It is now in my possession.—F. P. ABBOTT; 8, Beaconsfield Road, Dover, May, 1912.

PHRYXUS LIVORNICA, MANDUCA ATROPOS, AND HELIOTHIS PELTIGERA IN CORNWALL.—I have to record, between May 9th and 17th, the capture of fifteen *P. livornica*, one *M. atropos* (female); also one *H. peltigera*, taken at light in South Cornwall.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

SPHINX LIGUSTRI IN MAY.—A specimen of *S. ligustri* was captured on May 16th last at Hampton Wick.—E. A. C. STOWELL.

CERURA BIFIDA IN MAY.—At 5 p.m. on May 1st I found a newly emerged specimen of *C. bifida*, near the foot of a poplar-tree.—E. A. C. STOWELL.

POLYPLOCA FLAVICORNIS IN FEBRUARY. — On February 25th, between 11 and 12 a.m., I saw three specimens of *P. flavicornis* at Oxshott. They were drying their wings and sitting about a foot from the ground.—E. A. C. STOWELL.

TEPHROSIA PUNCTULARIA IN MARCH.—I can give an earlier date for *T. punctularia* than April 4th, mentioned by Mr. Dolton (*antea*, p. 157), as I found the species on palings at Esher on March 30th last.—E. A. C. STOWELL; Kingston Grammar School, Kingston-on-Thames.

LEPIDOPTERA AT LIGHT IN EARLY MAY.—The following records may be interesting as illustrating the abnormal early emergence of some insects this spring. After the long period of continuous easterly wind, a change took place on May 1st, and that evening the wind blew gently from the westward. Thinking I might obtain a few moths around the several street lamps in the neighbourhood, I went to see; not a specimen of any sort was about, although weather conditions appeared suitable. However, on the 3rd inst.—only two evenings later—around the same lamps I secured, in the course of an hour, one *Stauropus fagi*, *Notodonta trepida* (6), *Pheosia dictæoides* (1), and *Drymonia chaonia* (1), as well as seeing plenty of commoner species. During the following two nights I took several *N. trepida*, and one or more specimens of *P. dictæa*, *D. chaonia*, *Demas coryli*, *Panolis piniperda*, *Eustroma silaceata*, *Selenia tetralunaria*, one *Lobophora viretata*, and one *Anticlea nigrofasciaria*. The sudden emergence of Lepidoptera after the period of east winds struck me as being rather remarkable.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere, May 8th, 1912.

EARLY EMERGENCE OF LEPIDOPTERA.—It may be of interest to record the following early emergences:—April 20th, *Demas coryli;* May 4th, *Agrotis cinerea;* May 5th, *Dianthœcia cucubali.* The above all came to light at Warlingham. This afternoon (May 11th) I noticed *Macroglossa stellatarum* flying round the blossoms of *Iris florentina.*—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

DASYCAMPA RUBIGINEA AT CHRISTCHURCH.—On March 17th, when searching sallow-bloom in the Christchurch district, I found a female

D. rubiginea at rest on a twig of nut, some distance away from the nearest sallow. It laid over two hundred eggs, and later I had nearly one hundred larvæ feeding. — E. PIAZZA; 11, St. Philip's Road, Surbiton.

BLATELLA GERMANICA (ORTHOPTERA).—A specimen was found in Walker's Brewery, Warrington, on September 18th, 1911. It is now in the Warrington Municipal Museum.—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames.

NOTES ON LEPIDOPTERA FROM THE ISLE OF WIGHT.—*Vanessa io*, worn; *Pararge megæra*, common; *V. urticæ*, a few specimens; *Plusia gamma*, a few in good condition; larvæ of *Euproctis chrysorrhœa*, very abundant on the cliffs, where it was rare last year; whilst *Abraxas grossulariata*, larvæ of which swarmed last year, is almost non-existent this year.—STANLEY A. BLENKARN, F.E.S; "Teneriffe," Sandown, May 14th, 1912.

WEST SURREY LEPIDOPTERA.—Mr. H. O. Holford's record in the last number of the 'Entomologist' (*ante*, p. 157) enables me to supply some additional information concerning the Lepidoptera of West Surrey. In the early seventies my friend Mr. John Evershed, Junr., now of the Kodiakanàl Observatory in India, frequently collected with me in the neighbourhood of Wonersh, near Shalford, where his family then resided. One season (the exact year has unfortunately escaped my memory), we took at sugar quite a large number of *Calymnia pyralina*, my series being still in my collection, as I have never taken the species since. We were neither of us very greedy for numbers of specimens, and we only took a small portion of the number seen on the sugar patches. That same year *Xylophasia scolopacina* was quite abundant at sugar in the same district. At sallow, near Bramley, in the spring of that year, among the usual species, one specimen of *T. leucographa* was taken, this being, so far as I have been enabled to ascertain, the first Surrey record for this species.—R. MELDOLA; 6, Brunswick Square, W.C., May 3rd, 1912.

LAPHYGMA EXIGUA IN SOUTH WALES.—With my friend Mr. G. D. Hancock I spent last week in South Wales, in a vain search for larvæ of *X. conformis*. We were lucky enough, however, to find a good locality for *L. exigua*, of which we took eleven specimens in two nights, some on the wing, others at sugar. I see that Barrett states that the imago hybernates, and I have always understood that the specimens taken in the spring in this country are supposed to be immigrants. Judging, however, from the condition of those which we secured, I feel sure they were recently emerged and had bred where we found them. I always believed, too, that *L. exigua* liked a strong wind, and did not come to sugar till 11 p.m. or later. The two nights on which we took it were, however, warm and still. I took one insect on the wing at 8.30; the flight seemed to be over by 9 o'clock, and we were never out after 10 p.m.—PERCY C. REID; Feering Bury, Kelvedon, May 16th, 1912.

CORRECTION.—In the 'Entomologist,' vol. xliv. p. 285 (1911), Mr. E. R. Speyer recorded the dimensions, as ascertained by myself, of an unusually small specimen of *Pyrrhosoma nymphula* taken by him near Tunbridge Wells on August 1st, 1909. The measurements themselves are correctly quoted, but they relate to a male and not to a female example, as stated by Mr. Speyer.—H. C.

Collecting in Westmorland, 1911.—On June 4th we spent a pleasant morning amongst the butterflies, and netted a grand series of *Lycæna agestis* (male) in bred condition. The abnormal heat of May had hastened emergence, and both *Argynnis euphrosyne* and *Nemeobius lucina* were worn. A somewhat surprising capture in the same locality (dry limestone formation) was half-a-dozen *A. selene* in none too fresh condition. In this neighbourhood we generally look for *A. selene* towards the end of June, or even early July, and then only on the marshy hillsides. A couple of *Parasemia plantaginis* (early) and several *Prothymnia viridaria* completed the bag. Several hours beating of oak on the 5th produced only two full-fed larvæ of *T. quercus*. All foliage was unusually forward, and larvæ were greatly in advance of the average season. A couple of half-grown larvæ of *N. chaonia* fell into the tray, but both died after spinning up.

The evening of June 8th, with a bright cloudless sky, saw *P. plantaginis* flying in numbers. From 6.30 p.m. to 9 p.m., when the sun left the hillside, they dashed madly across the heather and bracken, never attempting to "settle." The effort needed to overtake and net even a few brought us quickly to a state of exhaustion. Generally, in an afternoon, and especially if the sky is overcast, *P. plantaginis*, when disturbed, will fly perhaps fifty yards and then drop, when it may, with caution, be successfully stalked; but this particular evening was quite evidently their "night-out"! The var. *hospita* is unmistakable on the wing, but several taken, even at this early date, were so far worn as to be hardly worth setting. It was a matter of considerable regret that other arrangements prevented me from following up this handsome species, but my friend, Mr. G. Holmes, was lucky enough to find a pair in cop. (male = *hospita*, female = type). From these he obtained a quantity of ova, and the resulting larvæ were fed on broad-leaved plantain. A good proportion fed up quickly, and during September and October he bred one typical male, ten var. *hospita*, and thirteen females, six of the latter being more or less crippled. *Hospita* is a lovely thing when bred. Two of them are noteworthy in having the black markings of the hind wing confined to the marginal area with the exception of a pair of short pencilled streaks at the base, which figuring gives the hind wings a strikingly white appearance. The same evening (8th) about 7 p.m. males of *Macrothylacia rubi* were flying low over the grass in search of females. Two of the latter sex were netted.

On June 11th I paid a visit to the "moss" in quest of *C. typhon*, and can confirm Mr. B. H. Crabtree's note (Entom. xliv. p. 319) on the early appearance of this insect. They were out in numbers, but many of the males and some females were looking very ragged. Judging by their condition, I can quite believe that *typhon* might have been taken on the 1st of the month. *Perconia strigillaria* and *Acidalia fumata* were abundant, and one newly emerged male *Diacrisia sanio* was taken. The same day a number of larvæ (about half grown) of *Triphosa dubitata* were found on the under sides of buckthorn leaves. This larva has a habit of resting in a curved position, with the head touching the eleventh segment. — FRANK LITTLEWOOD.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 20th*, 1912. — Rev. F. D. Morice, M.A., President, in the Chair. — The following gentlemen were elected Fellows of the Society:—Messrs. T. W. Allen, M.A., 30, Blenheim Gardens, Cricklewood, N.W.; Edward Stuart Augustine Baynes, 120, Warwick Street, Eccleston Square, S.W.; Gerald Bedford, Entomologist to the Union of South Africa, Department of Veterinary Science, Churchfelles, Horley, and Ondestepoort, Transvaal; Capt. Kenneth Alan Crawford Doig, R.A.M.C., M.R.C.S., F.R.C.P., Villa Sorrento, York Road, Woking; Messrs. Herbert L. Earl, 35, Leicester Street, Southport, Lancs; C. Jemmett, Ashford, Kent, and South-Eastern Agricultural College, Wye, Kent; R. D'A. Morrell, Authors' Club, 1, Whitehall Court, S.W.; Charles A. Schunck, Ewelme, Wallingford.—The death was announced of Mr. H. J. Adams, of Roseneath, Enfield. — Commander J. J. Walker exhibited specimens of *Claviger longicornis*, Müll. (with *C. testaceus*, Preyssl., for comparison), a species of Coleoptera new to the British list. They were taken under stones near Kirtlington, Oxfordshire, in May, 1906, and April, 1907, in nests of small yellow and black ants of a species not determined, but suggested by Mr. Donisthorpe to be *Lasius umbratus*.—Mr. Donisthorpe exhibited specimens of *Microdon mutabilis* bred in his observation nest of *Formica fusca* from Porlock, also the nest itself with the ants and a live larva of *Microdon* taken at Porlock, April 27th, 1911, and pupa-cases and larvæ of the fly in spirit. Mr. W. C. Crawley said that he had found one larva in a nest of *Myrmica ruginodis* instead of the usual host *Formica fusca*.—Professor Poulton exhibited the insects in the following list; all the specimens had been captured in forests within a few miles of Entebbe, between May 23rd and July 25th, 1909:—*Neptidopsis ophione*, Cram., *Neptis melicerta*, Drury, *N. agatha*, Stoll, *N. metella*, Dbl., Hew., *N. nicomedes*, Hew., var. *quintilla*, Mab., *N. nemetes*, Hew., *N. saclava*, Boisd., *N. nysiades*, Hew., ab. *continuata*, Holl., *N. puella*, Auriv., *Deilemera leuconoe*, Hopff., *D. transitella*, Strand.—Professor Poulton exhibited the male and female types of *Neptis swynnertoni*, a new species from S.E. Rhodesia, described by Mr. Roland Trimen, F.R.S., together with a specimen captured in the garden at Chirinda (3800 ft.) on March 28th, 1911, by Mr. C. F. M. Swynnerton. — Professor Poulton exhibited *T. formosa*, Godman, and its mimic, *Papilio rex*, Oberth., from the Kikuyu Escarpment, near Nairobi, British East Africa; the same Danaine, and the transitional *Papilio commixta*, Auriv., from Nyangori, at the north-east corner of the Victoria Nyanza; *T. mercedonia*, Karsch, and *Papilio mimeticus*, Rothsch., from Buddu on the west shore of the lake; and *T. morgeni*, Honrath, with three of its *Amauris* models—*psyttalea*, Plötz, *hecate*, Butler, and an undetermined species, probably new, from the Cameroons.—Professor Poulton exhibited the three largest Lycænidæ captured by Mr. W. A. Lamborn, and suggested that an undetermined pupa in the nest of *Œcophylla* might possibly belong to one of them. He pointed out, however, that all three were placed among the Lipteninæ, while the problematical pupa bore much resemblance to a smaller one which produced an imago belonging to the Lycæninæ. The three large species were *Epitola honorius*, F., male and female, *E. posthumus*, F., male, and *Hewitsonia boisduvali*, Hew., male and female. Mr. Lamborn's notes on the two females showed a remarkable degree of sluggishness.—Professor Poulton exhibited a male *Amauris egialea*, Cram., recently received from Mr. W. A. Lamborn. The "paper" enclosing the specimen bore the following note:—"8 a.m. Half mile [from Oni clearing]; Jan. 30th, 1912. Observed flying up and down. It then settled on upper surface of leaf and started to pass its brushes to and fro over its scent-patches, exactly as *Amauris niavius* did. Wings were rather over-flexed." Dr. F. A. Dixey and Professor Kellogg, of California, commented on this exhibit.—GEORGE WHEELER, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 8th*, 1912.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. R. Adkin exhibited an aberration of *Pyrameis atalanta* with a flesh-coloured band on the fore wing.—Mr. Newman, a series of *Ephyra annulata* var. *obsoleta*, in which the discoidal rings on the fore wings were absent.—Messrs. Mitford, Edwards, Coxhead, and West (Ashtead), exhibited slides under the microscope.

February 22nd.—The President in the chair.—Mr. Andrews, a number of species of the Trypetidæ family of the Diptera, all from Milford Haven.—Mr. Turner, a dwarf example of *Colias edusa* from near Villeneuve, measuring 32 mm. in expanse.—Mr. Sheldon, the Brenthids he took last year in Lapland, *B. frigga*, *B. frieja*, *B. polaris*, &c., and gave full notes on their characteristics and habits.

March 28th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. C. F. Lloyd, of Ashford Common, Middlesex, was elected a member.—Mr. B. H. Smith exhibited ova of *Amphidasys strataria* laid by a female with which he had assembled five males.—Mr. West, the specimen of *Psylla albipes* found by him at Box Hill in October last, and new to the British list of Hemiptera.—Mr. Newman, living examples of *Melitæa aurinia*, bred at a temperature of sixty to seventy degrees, and full-fed larvæ of *Dryas paphia* fed under similar conditions. He called attention to the extreme scarcity of larvæ of *Arctia caia* and of *Abraxas grossulariata*. Mr. W. G. Sheldon, specimen of *Leptosia sinapis* and *L. duponcheli*, with the summer broods of the same, var. *diniensis* and var. *æstiva* respectively, and pointed out that the British summer form of the former species was an intermediate form.—Mr. R. Adkin, a specimen of *Hadena porphyrea* (*satura*), and read a series of historical and critical notes on the species.—Mr. Andrews, the Syrphid *S. arcticus*, taken at Chattenden on March 12th.—Mr. Ashdown, a specimen of *Mysia oblongo-guttata* ab. *nigro-guttata*, from Oxshott, in May, 1911, and recently described as new.—Mr. Sich, for Mr. G. B. Routledge, a melanic example of *Depressaria aplana*, from Carlisle.—Mr. A. E. Tonge, a living specimen of *Callophrys avis*, bred *ab ovo*.—Mr. Edwards, examples of the closely allied Ornithoptera *O. lydius* and *O. crœsus*.—Mr. H. Main, the larva of the alder-fly, *Sialis lutaria*.—H. J. Turner, *Hon. Report. Secretary.*

RECENT LITERATURE.

Butterfly-Hunting in Many Lands: Notes of a Field Naturalist. By George B. Longstaff, M.A., M.D., F.R.C.P., F.G.S., &c. To which are added Translations of Papers by Fritz Muller on the Scent-organs of Butterflies and Moths: with a Note by E. B. Poulton, D.Sc., F.R.S. Pp.–xviii, 1–728. Plates i–xvi (seven coloured). London: Longmans, Green, & Co. 1912.

Of the ten chapters into which this handsome volume is divided, the first, entitled "Some Early Reminiscences," treats mainly of the author's field-work in various British localities. Among other interesting captures mentioned in this section we note—eighteen larvæ of *Orgyia gonostigma* on Wimbledon Common (1864); *Anticlea rubidata*, Wimbledon Common (1865); *Leucophasia sinapis*, Lyndhurst (1865); *Boarmia abietaria*, Rugby (1866 or 7); and *Macaria notata*, Combe Wood (1867).

In chapters ii–ix the author's impressions of the countries he travelled through, and the entomological observations he made therein, are chronicled in narrative form. Not only as regards butterflies, but every insect that presented itself to his notice seems to have been annexed, accurately identified, and its name entered in these interesting accounts of the author's wanderings in many lands. India and Ceylon were visited in 1903–4; China, Japan, and Canada in 1904; Algeria in 1905; South Africa in 1905; West Indies and South America in 1906–7; and New Zealand and Australia in 1910.

Under the heading "Butterfly Bionomics" (chapter x. pp. 489–600) are brought together valuable notes on several exceedingly interesting subjects such as Scents, Tenacity of Life, Successful Mimicry, Peculiarities of Life, Attitudes at Rest, Seasonal Forms, &c.

A series of papers on scent-organs in Lepidoptera (twelve in number) by the distinguished naturalist Fritz Müller, who died in 1897, form the Appendix (pp. 601–666). These papers, some written in German, others in Portuguese, have been ably translated by Mr. Ernest A. Elliott, and English students will be grateful to him, as well as to Dr. Longstaff, for their publication in the present volume. The Appendix, which is prefaced by an introductory note written by Professor Poulton, D.Sc., F.R.S., is illustrated by nine plates.

We can heartily commend this capital volume of travel and entomology. It is readable from cover to cover, highly interesting throughout, and very instructive. If we were disposed to cavil at aught, we might take exception to the title, which does not appear to present an adequate conception of the contents of the book.

The six excellent coloured plates, drawn by Messrs. Horace and Edgar S. Knight, represent some forty-eight species belonging to various Orders, and include twenty-two novelties.

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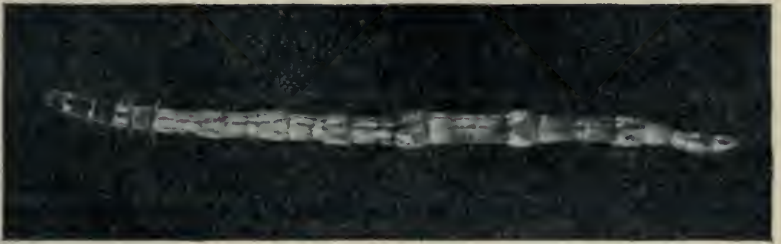
THE LARVA OF *CARDIOPHORUS ASELLUS* (COLEOPTERA, FAM. ELATERIDÆ).

BY DAVID SHARP, M.B., F.R.S, F.E.S., &c.



AT the beginning of this month I had the pleasure of meeting with this extraordinary larva near Bournemouth. I have for many years wished to see this larva, not only because of its peculiarity, but because some of the points in the literature about it are vague and obscure. Although the genus *Cardiophorus* abounds in species, some of which are very abundant in Continental Europe, yet the larva is so seldom met with that M. Henri du Buysson, who has devoted many years to the study of the European Elateridæ, has never seen it; and in his work ('Faune gallo-rhenane Elateridæ') recently completed has been obliged to content himself with a summary of the observations of Schiödte and Perris, who are apparently the only naturalists who have described this larva from personal knowledge.

When I obtained it I thought it desirable to obtain a photograph before it underwent *post-mortem* changes in form, and my friend Mr. G. T. Lyle has been so good and so skilful as to produce a likeness that gives an excellent idea of the form and of some of the peculiarities of the creature, for which we owe him our best thanks.

When alive the larva is totally dissimilar in its movements from other Elaterid larvæ, being very quick and agile. The posterior part of the elongate body trails behind, and when it moves forward does so with a sort of peristaltic movement. But the anterior parts are quite different in action; they are held raised a little from the ground, and moved about quickly from side to side; the head moves the most freely, and the mouth-parts are kept in constant and rapid vibration, like the tongue of a snake; the movements indeed are singularly reptilian, as well as the form of the creature.

As regards the extraordinary segmentation, we may remark that at first sight there appear to be: head + 4 thoracic + 23 abdominal segments. A careful examination reduces the number of segments to that normal for coleopterous larvæ. What appears in the photograph to be the head is really the prognathous mouth-pieces, which are separated from the rest of the head (*i. e.* the elongated part that immediately follows) by a transverse division that extends completely round. The head, in fact, is excessively elongate, and may be described as pseudo-bisegmental. The first thoracic segment is hard and of a brown colour like the head; all the following parts are pale and soft. In length the three thoracic segments are subequal; and the first is connected with the head, the third with the first abdominal, and the three one with the other, by means of intersegmental membranes that do not differ greatly from the intersegmental membranes of ordinary Elaterid larvæ except by being somewhat longer and more exposed than usual. The apparently increased number of abdominal segments is due to great elongation and exposure of the intersegmental membranes. The number is made up thus: first abdominal segment consists of two divisions, segments 2–7 consist each of three divisions, segment 8 of two divisions, and segment 9 is single; thus making up twenty-three, the pseudo-segmental number. The true tenth abdominal segment is concealed in a dorsal view by being placed under the ninth. When the larva is alive there is a slight difference in colour and texture between the supernumerary divisions and the others, that confirms the interpretation of the abdominal structure I have just given.

The larva was found by Mr. A. Ford, of Bournemouth, and myself side by side with specimens of *Cardiophorus asellus* (of British collections). No other *Cardiophorus* is known to occur at Bournemouth, so that the connection of the larva and imago is not open to doubt. I mention this because the larva described and figured by Schiödte in his well-known work is said to be that of *C. asellus*. If so, his figure is far from successful, and I believe it really pertains to a species different from that I have described. Perris's figure (204, 'Larves de Coléoptères') is said to be *C. rufipes*: this figure gives a better general idea of our larva than does that of Schiödte, which is far too broad and robust.

The peculiarities of the larva of *Cardiophorus* are far from being confined to its segmentation. But a consideration of them would involve comparisons and discussions that would extend far beyond the limits of an article in the 'Entomologist.'

I may mention that the larva was found in the purest and driest of fine sea-sand. It was brought home in a tin containing some of the sand; this was wetted and so made more solid, and the larva evidently appreciated this, and burrowed in the wet sand. I did not keep it long alive, as I feared it might change to a pupa. I have no doubt that it is carnivorous and predaceous.

Brockenhurst: May 28th, 1912.

NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

By F. W. Edwards, B.A., F.E.S.

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Considering the great interest now taken in the blood-sucking gnats or "mosquitos," their economic importance in relation to disease, the large number of workers engaged in their study, and the enormous output of literature concerning them, it is somewhat remarkable that so little has been written about the British species. Indeed, the only attempt at a general systematic account of them (apart from the treatment in Walker's 'Insecta Britannica, Diptera' [1856]), so far as I am aware, is that of Stevens, published in 1825. Needless to say, these are hopelessly out of date, and the descriptions are so meagre that it is impossible to recognize to what insects they are intended to apply. Thus their determination is a matter of needless difficulty. It is true that good descriptions of most of the species are to be found in Theobald's 'Monograph of the Culicidæ of the World,' but these have to be picked out of an enormous mass of material, while the keys to the genera and species which the author gives are in many cases difficult of application and not of much value; to say nothing of the fact that his system of classification is not accepted by other entomologists who have studied these insects, and by dipterists in general. This being the state of affairs, it seems as though it would be of use to give a concise synopsis of the British species, taking into account the most recent researches. It is hoped that the following tables and notes will be found workable and helpful, and that they may be the means of inducing some to take up the study of these interesting insects during the present summer. There is much work yet o be done before our knowledge of them approaches completeness: the larvæ of several species are yet undiscovered, and it is probable that even the number of species on the British list is not yet complete. One species is introduced in the present paper as new to our fauna, and others are very likely to occur if searched for.

The writer merely hopes in these notes to pave the way for further and more detailed work by enabling the collector to name his material correctly. With this end in view, tables for determining the adults are given, with brief descriptions of each species. The common gnat is so well known that no general description is necessary—all Diptera with a long proboscis and the same type of wing-venation as is found in *Culex pipiens* may be assumed to be "mosquitos." This term is rightly applicable to any member of the group, and should not be limited to a particular species or genus.

The following artificial key may serve as a rough guide in the identification of a specimen, but its proper generic position should, of course, be ascertained by the aid of the tables:—

A. Tarsi ringed with white at the bases of the joints.
  a. Metatarsi without a median pale ring.
    O. cantans, *O. annulipes*, *O. vexans*.
  b. Metatarsi with a median pale ring.
    Th. annulata, *Tæn. richiardii*.
B. Tarsi pale-ringed, the rings embracing both ends of the joints.
  a. Abdomen with a median longitudinal pale stripe, more or less interrupted.
    O. dorsalis.
  b. Abdomen without such stripe, but with whitish bands at the bases of the segments.
    Th. morsitans, *Th. theobaldi*.
C. Tarsi entirely dark.
  a. Abdomen not scaly. *Anopheles*.
  b. Abdomen scaly.
    i. Segments of abdomen with complete basal pale bands.
      O. diversus, *O. nemorosus*, *O. salinus*, *C. pipiens*.
    ii. No complete pale bands on abdomen.
      O. lateralis, *A. cinereus*.

Table of Genera.

Males (antennæ plumose):

1.	Scutellum rounded; legs very slender; abdomen without scales	1. ANOPHELES.
	Scutellum more or less trilobed; abdomen scaly (the scales are, of course, easily rubbed off, but will be quite evident except in very bad specimens)	2.
2.	Palpi very short	3. AËDES.
	Palpi long, rarely shorter than the proboscis .	3.
3.	Last two joints of palpi more or less swollen, and never curved upwards	4.
	Last two joints of palpi quite thin, curved upwards	6. CULEX.
4.	Last joint of palpi distinctly thicker than the penultimate	5. THEOBALDIA.

Last joint of palpi never thicker than penultimate, usually distinctly thinner . . . . . . 5.
5. The smaller claw on the fore and mid feet simple (metatarsi with pale rings in the middle) 4. TÆNIORHYNCHUS.
The smaller claw on the fore and mid feet toothed (metatarsi not pale-ringed in the middle) 2. OCHLEROTATUS.

Females:
1. Palpi as long as proboscis . . . . . 1. ANOPHELES.
Palpi much shorter than proboscis . . . . 2.
2. Claws toothed (rarely the hind pairs are simple); abdomen pointed; ovipositor externally prominent . . . . 3.
Claws all simple; abdomen usually blunt-ended; ovipositor hardly visible externally . . . . 4.
3. Head almost covered with broad flat scales . . 3. AËDES.
Middle of head (above) with only quite narrow scales . . . . 2. OCHLEROTATUS.
4. Hind metatarsus shorter than the tibia . . . 5.
Hind metatarsus as long as the tibia . . . . 6. CULEX.
5. Cross-veins separated by less than the length of the posterior; lateral vein-scales narrow . 5. THEOBALDIA.
Cross-veins separated by more than the length of the posterior; lateral vein-scales mostly rather broad . . . . 4. TÆNIORHYNCHUS.

Genus 1. ANOPHELES.

The species of this genus are readily recognized by the long emale palpi, and by a number of minor characters, such as the bsence of scales on the body.

We have only three species of *Anopheles* in Britain. Theobald, ndeed, states that he has taken a fourth—the North American *A. barberi*—in England, but this requires confirmation. The arva of *A. barberi* is distinguished from those of other *Anopheles* by "the slight development of the head hairs, the presence of lumose hairs after the third abdominal segment, and the bsence of short teeth on the comb of the eighth segment."

1. *A. maculipennis*, Mg.; the Spotted Gnat.—Distinguished rom the other two species by the presence of spots on the wings, ormed by the accumulation of scales. Grey-brown to grey-chreous in colour. Average length (without proboscis), 6 mm. Widely distributed in the south and east of England, and ommon in marshy places; occurs also in North Wales.

2. *A. bifurcatus*, L.—Closely resembles *A. maculipennis* in ize and colour, but differs most obviously in the entire absence the dark spots on the wings. It seems to be less common han the preceding, but has a similar distribution.

3. *A. plumbeus*, Stephens.—Smaller and darker than the wo preceding; the wings are somewhat narrower, the scales

being blacker and rather denser; the thorax (in good specimens) is ashy-grey in the middle, blackish at the sides, and bears anteriorly some white hair-like scales, the vestiture of the thorax in the other two species being yellowish; the abdomen is black, not brown or greyish-brown. Average length, 4·5 mm.

This species seems to have a wider distribution than the other two, as it has been recorded from Scotland and Ireland. As Theobald remarks: "There is little doubt that Haliday's [Stephens's] *A. plumbeus*, taken in the North of Ireland in July, is this species [*A. nigripes*, Staeger]." It is best known under this latter name.

Genus 2. OCHLEROTATUS.

This genus includes most of the European species till recently placed in *Culex*. It is, however, at least as distinct from *Culex* as *Aëdes* is. The eggs are deposited singly (as in *Aëdes*), not in masses (as in *Culex*).

The writer has been able to recognize eight species in Britain, which can be distinguished as follows:—

1.	Tarsi (especially those of the hind legs) pale-ringed .	2.
	Tarsi entirely dark	5.
2.	Pale rings of tarsi embracing both ends of the joints, on hind legs the whole of the last joint is pale .	1. *dorsalis.*
	Pale rings of tarsi at bases of joints only	3.
3.	Pale rings of hind tarsi very narrow; wing-scales all dark	2. *vexans.*
	Pale rings of hind tarsi broad, except on first and last joints; wings with both dark and light scales .	4.
4.	Yellower species; a broad band of yellowish scales on each side of the mesonotum	3. *annulipes.*
	Browner species; mesonotum mostly brown-scaled, with lateral spots or lines of whitish scales .	4. *maculatus.*
5.	Segments of abdomen with basal pale bands; margins of thorax not whitish	6.
	Segments of abdomen with lateral basal white spots; margins of mesonotum broadly white-scaled . .	8. *lateralis.*
6.	Wings speckled with light and dark scales, on nearly all the veins	5. *salinus.*
	Wings with few or no light scales	7.
7.	Pale bands of abdomen yellow, tending to spread out in the middle, and sometimes forming a median yellow line on the last few segments	6. *diversus.*
	Pale bands of abdomen whitish, tending to spread out laterally, and sometimes almost divided into pairs of triangular spots	7. *nemorosus.*

1. *O. dorsalis*, Mg.—Scales of head bright reddish-brown at the sides, whitish in the middle. Thorax mainly clothed with bright reddish-brown scales, but with two rather broad whitish longitudinal stripes. Wings and legs speckled with dark and

light scales, as in *O. maculatus* and *O. nemorosus*. Abdomen with yellowish bands, each embracing two contiguous segments, and connected by a median dorsal yellowish line, so that in pale specimens each segment of the abdomen appears to have a pair of subquadrate dark brown patches. Average length, ♂ 6·5 mm., ♀ 5 mm.

This species occurs abundantly at Aldborough, Suffolk, and has been taken at various places in the London district (Charlton, Dartford, Albert Docks, Lewisham, Camberwell, Chiswick, Stamford Hill), and at Rochester and Wyre Forest.

I believe that Rondani's *Culex pulchripalpis* and *C. penicillaris* are both synonyms. Theobald introduced *C. pulchripalpis* as British on the strength of some specimens of this species taken at the Albert Docks.

2. *O. vexans*, Mg.—Thorax dark brown, uniformly clothed with dark golden-brown scales. Pale bands of abdomen (in female at least) narrowly interrupted at the sides and indented in the middle, so that they appear bilobed. Male genitalia very peculiar, the claspers being forked. Average length, ♂ 6 mm., ♀ 5 mm.

This species has at present but slender claims to a place in the British list. It has been confused with *Theobaldia morsitans*, and probably some of the old records of *O. vexans* really refer to that species. In the old Clifton collection in the British Museum were seven specimens of this species, all without locality label—three females unnamed, and two males, two females labelled "*? calopus*, Meig." Apart from these the only British specimens I have seen or heard of are a male and female in the Cambridge Museum, taken at Mildenhall, Suffolk, July, 1894, by Mr. C. G. Lamb. Both these are very much rubbed, and the characteristic abdominal markings of the female removed.

O. vexans occurs, I believe, in North America under the name of *sylvestris*, Theo.—variously placed in *Culex*, *Ecculex*, or *Aëdes*. Theobald's type was said to have the hind claws of the female simple, but most American specimens have them toothed, like the European *O. vexans*.

(To be continued.)

DESCRIPTION OF A NEW SPECIES OF *ANOMALON* (ICHNEUMONIDÆ) FROM HONGKONG.

By P. Cameron.

Anomalon pyretorum, sp. n.

Ferruginous, the abdomen brighter in tint; the front broadly, the vertex less broadly, occiput, the greater part of mesonotum, the lower part of the pro- and mesopleuræ, the metathorax, and more than the basal three-fourths of the second abdominal segment above, black; the four front legs bright yellow, the coxæ broadly at the base below rufous, the hind legs rufous, the coxæ in the middle broadly above and entirely below, and the apical third of the hind tibiæ, black, the hind tarsi yellow, tinged with fulvous, the base rufous. The face, clypeus, mandibles, and palpi bright yellow, as are also the malar space and a line on the lower part of the outer orbits. Wings fulvous-hyaline, the apex broadly tinged with fuscous violaceous, the nervures black, the costa and stigma rufo-testaceous. Male. Length, 28 mm.

Bred from the larva of *Saturnia pyretorum*, West. Received by Mr. J. Henry Watson from Hongkong.

Head, thorax, and base of legs densely covered with pale, almost fulvous pubescence. The vertex between the ocelli is irregularly, stoutly striated, a stout stria runs down from outside the posterior ocelli, and two stout oblique ones from between the outer and lower. Parapsidal furrows with stout striæ, which are more numerous on the base. Middle of propleuræ stoutly striated, the striæ almost forming reticulations; there is a broad reticulated band on the mesopleuræ below the middle, the band widest at the base. Metathorax strongly reticulated. Mesosternal furrow curved, crenulated; it is on the basal two-thirds. The transverse median nervure is received shortly beyond the transverse; in the hind wings the transverse cubital is broken shortly below the middle. The basal joints of the flagellum are yellow below.

SOME NEW SPECIES OF *ZAMARADA* (Fam. GEOMETRIDÆ).

By Louis B. Prout, F.E.S.

Chiefly through the kindness of Mr. F. W. Short, B.Sc., F.I.E., of Selukwe, S. Rhodesia, I have accumulated some very interesting material in the genus *Zamarada*, Moore, which seems to be remarkably prevalent in his district. As most of the forms are represented by more than one specimen, and entirely without intergrades, there can be no reasonable doubt as to their specific rank, although the structural uniformity throughout the genus robs one of the most decisive criteria. I subjoin descriptions of the new species.

Zamarada bathyscaphes, n. sp.

♂ ♀, 26–27 mm. Face and palpus mixed red and pale ochreous. Vertex and antenna pale ochreous; occiput red. Thorax and abdomen above red, beneath (with legs) pale.

Both wings very pale, iridescent yellow-green, with small basal patch, broad distal border, slight inner-marginal shading and very small discal spot red (a blend of bright rufous, yellowish and violet scales), the fore wing in addition with costal edge (to SC) ochreous spotted with red; the distal border 4 mm. broad anteriorly on fore wing, slightly less posteriorly and on hind wing, margined by a fine darker red or blackish line proximally and traversed by a usually indistinct, interrupted, dentate, pale (in some lights silvery) subterminal line; between R^3 and M^2 the ground colour encroaches very deeply into the band, almost touching the termen at M^1 and M^2, but leaving a small pyramidal red spot between these veins. Fringe yellowish, marked with red at the vein-ends. Under side similar, slightly paler, the red border without markings.

Selukwe, October, 1911; two females (type and co-type). Also three males: one taken early in 1911; one, December, 1911; one, March, 1912. In the females the discal spot of hind wing is almost obsolete, but it is distinct in all the three males. Otherwise there is no appreciable variation, except slightly in the strength of the markings on the border. May possibly prove a local race of *vulpina*, Warr. (Novit. Zool. iv. 123), from West Africa.

Zamarada purimargo, n. sp.

♀, 29 mm. Face and palpus rufous mixed with pale ochreous. Vertex and antenna pale ochreous. Occiput with thorax and abdomen dorsally bright rufous with slight violet reflections.

Fore wing very pale, translucent yellow-green, with hyaline reflections, veins yellower; costa to SC pale ochreous, except at base; a small red basal patch, a distal border of about the same breadth as in the preceding species, of a delicate rufous with a slight admixture of shining violet scales, without traces of pale or dark markings, and with only a comparatively shallow, rounded sinus (narrowing the border by less than half its width) between R^3 and M^2. Hind wing similar excepting costa, but the basal patch much smaller and the proximal edge of the red border running obliquely after the sinus, so as to reach inner margin at middle. Fringes pale yellowish, tinged with red proximally. Under side quite similar, somewhat more washed-out.

Selukwe, October 20th–27th, 1911; type in coll. L. B. Prout. A co-type, precisely similar, but with minute discal dots, which are virtually obsolete in the type, Lilongwe district, Central Angoniland, 4–5000 ft., June 2nd, 1910 (S. A. Neave) in coll. Brit. Mus.

Perhaps nearest to *pyrocincta* ab. 1 of Hampson (Proc. Zool. Soc. Lond., 1910, p. 470), but with larger basal patch, terminal bands broader, more devoid of markings, and at inner margin of hind wing quite differently shaped.

Zamarada nebulimargo, n. sp.

♂, 27–29 mm. Face and palpus ochreous, mixed with reddish fuscous. Vertex, antenna, and dorsal surface of body the same, body beneath and legs (excepting upper and inner side of fore leg) without fuscous admixture.

Fore wing pale brownish ochreous, very finely (along costa coarsely and more densely) speckled with fuscous, the costal region to SC somewhat deeper and brighter ochreous, inner-marginal area also somewhat clouded: a large, somewhat diamond-shaped purple-fuscous discal spot, blacker at edges, and a moderately broad distal border of a somewhat darker, more reddish tone, irregularly dusted with purple-fuscous, this dusting sparse in distal half, but concentrated in proximal into a somewhat interrupted purplish band from SC to inner margin (weakest between radials), followed by some tooth-shaped dark markings between the veins; the sinus between R^3 and M^2, common to most of the genus, is present though not very deep; a very fine sinuous ferruginous-fuscous line precedes the border; terminal dark line slightly interrupted; fringe pale brownish ochreous. Hind wing similar, the purplish half-band in distal area somewhat weaker. Under side similar, more thinly scaled, almost unmarked excepting the cell-spots and submarginal band, which are rather deeper purple; costa nearly as above; marginal band ochreous, not reddish-tinted.

Selukwe, October, 1911; type in coll. L. B. Prout. Three other males, worn, but recognizable (by their colour, large discal spots, &c.), October, 1911, and March, 1912; also in coll. L. B. Prout. Victoria Falls, February 20th, 1911 (L. A. Sabine), male in coll. L. B. Prout. Salisbury, Mashonaland, March, 1899, February, 1900, and March, 1905 (G. A. K. Marshall); Fort Jameson to Lundazi, N.E. Rhodesia, 4000 ft., June 14th, 1910 (S. A. Neave); all in coll. Brit. Mus. Female still unknown.

Perhaps rather near *ochrata*, Warr. (Novit. Zool. ix. 518), from British East Africa, but larger, without basal patch and median shade, and with other differences.

Zamarada ignicosta, n. sp.

♂, 27 mm. Face, crown, and proximal half of antennal shaft pale ochreous, almost entirely covered with bright rufous speckling. Palpus, antenna distally, and collar pale ochreous. Thorax and abdomen above mostly covered with bright rufous and violet, the former with a narrow anterior band concolorous with costa of fore wing, the latter with paler mediodorsal spots.

Wings hyaline, very pale greenish, with iridescent reflections; a rather faint but coarse speckling or short strigulation of reddish brown, denser at inner margin. Fore wing with costal margin reddish ochreous much mixed with bright red and sprinkled with minute lustrous bluish-silvery scales. Both wings with indistinct dark discal dot and rather narrow distal border, formed and coloured about as in the Indian *translucida*, Moore, bounded proximally by a deeper red line and traversed by an interrupted, dentate silvery line, which encloses proximally within some of its teeth subtriangular red spots of a deeper red colour than the ground of the border; traces of other silvery lines proximally and distally to the dentate line. Fringe reddish, darkest opposite the veins; a sprinkling of minute silvery scales. Under side with the border present, but duller; no lustrous scales.

Victoria Falls, Rhodesia, May 26th, 1911 (L. A. Sabine); type in coll. L. B. Prout. A second male from Upper Luangwa, Luwumba Valley, N.E. Rhodesia, 2500–3500 ft., July 21st, 1910 (S. A. Neave), in coll. Brit. Mus., may belong to the same species, but the vertex and antennal shaft are pale (the specimen possibly a little faded), and the under side has, at the two broad parts of the fore wing border and the anterior one of the hind wing, blackish proximal markings of which the type shows no indication.

Although the ground colour of this species, when viewed from above, is nearly as green as that of *bathyscaphes*, *purimargo*, &c., the iridescent reflections are mainly pink and purple, giving it an entirely different aspect on a change in the incidence of the light.

Zamarada fessa, n. sp.

♂ ♀, 24–30 mm. Head, body and wings pale grey with a slight lilacine tinge, more or less speckled with fuscous; the under side of body, with legs, paler and more ochreous, scarcely speckled.

Fore wing with costal margin ochreous, densely dark-speckled, as far as outer line otherwise hyaline, almost colourless, somewhat less iridescent than in most of the allies; a distinct black discal dot; a moderately broad distal border formed of a blend of violet-grey and reddish scales and containing some very slightly darker, redder dentate spots suggesting a very vague and interrupted band before the subterminal, the subterminal itself almost entirely obsolete; a weakly lunulate-dentate dark line (proximally ochreous-edged) bounds the distal area, into which the ground colour projects moderately between R^3 and M^2; terminal line more ochreous; fringe grey. Hind wing similar, excepting the costa. Under surface with the distal border more sombre, more uniform, not bounded by a dark line.

Selukwe, four males, four females, October, 1911, to January, 1912; the type (a female) taken October 20th–27th, 1911; all in coll. L. B. Prout.

Zamarada metrioscaphes, n. sp.

♂, 26 mm. Face, vertex, and antenna ochreous, spotted with blackish fuscous. Palpus ochreous. Abdomen dorsally purple-fuscous, with some ochreous spots.

Fore wing pale, translucent yellow-green irrorated with scattered fuscous strigulæ, more copious at inner margin; costa to SC ochreous coarsely marked with blackish, especially in proximal half; discal spot moderately large, purple-blackish; distal border purple, somewhat mixed with reddish ochreous, preceded by a fine, weakly lunulate-dentate black line, the encroachment of the ground colour between R^3 and M^2 deeper than in *transvisaria*, Guen., but not so deep as in *bathyscaphes*, narrowing the border by slightly more than one-half; in the middle of the border, interrupted from R^3 to M^2, runs an acutely dentate pale ochreous subterminal line enclosing proximally some sharply-marked dark pyramids between the veins, their bases redder, their apices blacker; terminal line reddish ochreous; fringe olivaceous, at base pale ochreous, dark-spotted opposite veins. Hind wing similar, discal spot small. Under side similar, but with distal border mostly pale, only purplish in anterior half of fore wing and proximal part of anterior half of hind wing, the subterminal line and pyramids wanting.

Selukwe, November, 1911; type in coll. L. B. Prout. A worn female with the border more reddish (same time and place) is probably also referable here. Near Chikawa, Lower Shire Valley, Nyassaland, 600 ft., April 12th, 1910 (S. A. Neave), co-type (male) in coll. Brit. Mus.; also a female, slightly larger and duller, from Blantyre, Nyassaland (J. E. S. Old), in coll. Brit. Mus.

In coloration, &c., this species suggests a small edition of *transvisaria*, Guen., except for the dark irroration and the shape of the distal borders.

Zamarada aclea, n. sp.

♀, 26–27 mm. Very like the forms of *translucida*, Moore, with the narrowest border and the purple-brown parts lightest and most reddish, but differing as follows: Body and border of wings slightly more reddish still, the latter perhaps slightly narrower; the green ground colour lighter, a small red basal patch present on fore wing; the minute dark discal dots obsolete, the entire green area, on the other hand, faintly dotted and strigulated with grey; under side with the border bicoloured, its proximal part in apical half of both wings and towards tornus of fore wing being dark (nearly as in *translucida*), the rest much lighter and redder, fading off still further towards tornus of hind wing.

Selukwe, November, 1911 (type), and December, 1911 (co-type); both in coll. L. B. Prout.

DESCRIPTION OF A NEW ETHIOPIAN CICADA.

By W. L. Distant.

Platypleura liberiana, sp. n.

Body and legs pale ochraceous; vertex of head with a spot at each anterior angle, a waved transverse fascia widened at area of ocelli, and three small irregular spots at base near each eye, fuscous or black; pronotum with the subanterior margin (medially broken), two small central spots near base, and the outermost fissures, black; mesonotum with four obconical spots—the two central spots smallest—and a spot at each anterior angle of the basal cruciform elevation, black; abdomen above, with the exception of central longitudinal disk, pale castaneous; tegmina opaque, dull greyish with darker shadings, the venation, costal membrane, and basal area pale ochraceous; wings dark ochraceous, opaque, shadings at the bases and apices of the apical areas, along the inner longitudinal veins, and most of the posterior margin dark castaneous, the inner half of the posterior margin greyish brown; head, including eyes, about as wide as base of mesonotum, not frontally produced, anteriorly subtruncate, ocelli large, the frontal ocellus almost visible beneath above face; face longer than broad, strongly, centrally, longitudinally sulcate, finely, transversely striate, cheeks globosely prominent; antennæ black; pronotum with the lateral margins ampliated, and broadly, centrally angulated, about as long as mesonotum in front of the cruciform elevation; abdomen moderately elongate, but not longer than space between apex of head and base of cruciform elevation; opercula in male short, obliquely rounded, not extending beyond basal segment of abdomen, and almost meeting internally; rostrum reaching the posterior coxæ, its apex black; abdomen beneath with the stigmatal spots ivory white. Long. excl. tegm. ♂ 27 millim.; exp. tegm. 75 millim.

Hab. West Africa; Liberia (W. P. Lowe—Brit. Mus.).

A very distinct species, belonging to the section of the genus characterized by having opaquely coloured tegmina and wings, and may be placed near *P. makaga*, Dist.

DORSET ODONATA IN 1911.

By F. H. Haines, D.P.H. (Lond.), &c.

A few observations made by me round Winfrith last summer may be of interest in connection with Mr. Lucas's notes on British Odonata in 1911.

Sympetrum striolatum and *S. scoticum* were abundant as usual. The latter is generally confined to fenny places, near the heathlands. *Libellula depressa* is always widely distributed and common. I first noticed *L. quadrimaculata*, in great abundance, round a large pond on Morden Heath, on May 27th. On June 20th, it was common at Trigon near Wareham, and was far more widespread than usual in all suitable spots, such as open fir-woods and wet moors, from Holme to Moreton throughout June. *L. fulva* occurs every year, in some plenty, over a few square yards of ground near a boggy area at Holme. Here it settles very warily on small fir-trees and furze bushes. Once known, flying or settled, it could not be easily confused with any other species. It is to be found at the end of May, and blue males are seen quite at the beginning of June. Last year it was in remarkable profusion here and there over the same stretch of wild country as *L. quadrimaculata*, and continued well into July. *Orthetrum cærulescens* abounds over the heathy swamps every year, and I noticed, as I had not done previously, *O. cancellatum* at East Lulworth and Moreton in sandy hollows and on the road. *Cordulia ænea* swarmed at Morden on May 27th on a very large extent of morass and wet fir plantations, and over the very large pond in the woods there. A few specimens were still about on June 28th. *Cordulegaster annulatus* is frequent every year. I saw *Anax imperator* first at Trigon on June 20th. Later I noted two specimens at Moreton. *Brachytron pratense* was in evidence at Holme about the end of May. In June I took it on damp ground covered with rank growth by the Frome at Iford. Feeling certain that I can distinguish *Æschna mixta* from *Æ. juncea* on the wing, partly by its smaller size, but more especially by its very different habit of flight, I can all but positively record three specimens—one at Bindon Abbey, one at East Stoke, and one at East Lulworth. *Æ. juncea* is fairly distributed year by year from Galton to Parley and Arne. *Æ. grandis* occurred at Holme near East Burton, and at Bindon Abbey. *Calopteryx splendens* is ever in profusion in open flowery tracts by the Frome and its branches. *Lestes sponsa* is common here, as is also *Pyrrhosoma nymphula*. *P. tenellum* was met with, as is the rule, at Tadnoll marsh. It was frequent, too, on Studland Heath. *Ischnura elegans*, *Agrion puella*, and *Enallagma cyathigerum* were once more in force in their haunts.

I may add that I took eight specimens of *A. mercuriale* in this immediate neighbourhood, doubtless near the Frome, a few seasons ago. Not distinguishing the species at once, the precise place of capture is unknown to me and I have never met with it again.

I do not work the Odonata in my leisure more than other orders, and the species named above, with *Æ. cyanea*, are all I identified here last season.

Brookside, Winfrith, Dorset: May 4th, 1912.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief Gervase F. Mathew, R.N., F.E.S., &c.

(Continued from p. 180.)

July 8th was a very hot day—eighty-one degrees in the shade at noon. Three *T. apiformis* were taken on poplars. I have lately been breeding a number of *Pieris napi* from South of Ireland ova—no particular varieties, but some very bright and clearly marked specimens.

The 11th was fine, bright and hot, with a fresh north-easterly breeze. I went to the distant woods, as I wanted some fresh *Argynnis adippe*, but I only saw one specimen of that species, seven or eight *Limenitis sibylla*, and about a couple of dozen *A. paphia;* these three species used to swarm in these woods some years ago, but they now seem to be nearly extinct. *Adopæa thaumas* (*linea*) was plentiful and fresh, and I took one *Herminia derivalis*, but saw nothing else worth noting.

The 12th was another very hot day. The second brood of *Cyaniris argiolus* was now rather numerous, and *Arctia caja*, *Noctua baja*, &c., were appearing in my breeding-cages. The larvæ of *Saturnia carpini*, from the ova laid on May 13th, were now full grown. I sleeved them on a sallow-bush in my garden.

The 14th was very hot. I had a beautiful variety of *A. caja* brought me, with hind wings bright yellow. I went to the lanes and marshes in the evening and I noticed quantities of beautifully fresh *Adopæa lineola*, sitting on grass-stems after sunset, and boxed a couple of dozen, nearly all males. I also took five *Leucania favicolor* on flowering grasses, two of which were the red var. *rufa*, and two the yellow var. *lutea*. *L. impura* was abundant, also *Miana colorata*, but not much else except a few *Ancrastia lotella* and one *Spilodes* (*cinctalis*) *verticalis*. *C. dotata* was flying commonly in the lanes.

The 17th was fine, overcast, very warm, and nearly calm. At night I went to the marshes and sandhills and found moths swarming on the marram grass. I took several *L. favicolor*, but they were so worn I had to release them the next morning. *M. abjecta* was in fair numbers; *L. pallens*, *L. impura*, *Apamea oculea*, *Miana bicolorata*, and *Xylophasia polyodon*, in profusion; and among the others were *Agrotis nigricans*, *Leucania conigera*, and *Hydrilla paludis* (one); *A. lineola* was also plentiful on the grass-stems.

21st. The hot weather still continued, and in the evening, as it was almost calm, with no dew or moon, I went to the reedy dykes, but did not see much flying at first, except a few *Chilo phragmitellus*. Upon reaching a favourable-looking place, I stood still and threw the light of the lantern on to the reeds, and presently a moth fluttered out towards me and was netted, and proved to be *Senta ulvæ maritima*. This was a good beginning, so I remained where I was for nearly two hours, just moving a pace or two to the right or left, and every minute or so a moth came out (sometimes two or three together), and I eventually found that I had secured thirteen *S. maritima*, seven *Nonagria arundineta*, two *Leucania straminea*, one *Hydrœcia paludis*, and several *Chilo phragmitellus*, *Timandra amataria*, *Coremia unidentata*, and *Agrotis tritici*. On my way home I passed a large clump of flowering rushes, and upon every flower there were two or three moths, chiefly *L. conigera*, *L. lithargyria*, *L. impura*, *T. amataria*, *E. pumilata*, &c.

On the 22nd I bred eight *Drepana hamula*, from ova laid by the female captured on May 29th. The larvæ were sleeved upon an oak in my garden. (I subsequently bred about thirty more, and obtained a batch of ova.)

The 23rd was bright and very warm—ninety-six degrees in the shade. *Pelurga comitata* and *Tortrix viburniana* were now appearing in breeding-cages. The evening of the 25th was fine, calm, close, and very warm, with lightning and distant thunder. I visited the reed-dyke again, and netted thirty *N. arundineta*, six *S. maritima*, three *H. paludis*, one *M. maura*, &c. About half the *arundineta* I have taken are the black form *dissoluta*. This moth flies low down among the reeds, and I seldom saw any flying high above them, so it requires a quick eye to see them.

26th. Similar weather to yesterday, only there was a sharp thunder-shower about 7 p.m. Visited the reeds again and got more *arundineta*, *maritima*, *straminea*, *paludis*, &c.; among the former there were two very interesting red varieties, and among the *maritima* there were several var. *bipunctata*. On my way home I found *T. amataria* and *A. emarginata* swarming, but they were mostly worn, and among others I netted *Lithosia griseola*, *L. complanula*, *Calamia phragmitidis*, *Boarmia rhomboidaria*, &c.

The 28th was a fine and very hot day. In the evening I went to the salterns and sea-banks. I found moths swarming on marram grass, but there was nothing fresh—chiefly *L. impura*, *M. abjecta*, *H. paludis* (already worn), &c. It began to rain at about ten o'clock, with thunder and lightning, and I was afraid a big storm was coming on, so I hurried home.

(To be continued.)

NOTES AND OBSERVATIONS.

Natural History Books from the library of the late Mr. A. Harrison will be sold by Mr. J. C. Stevens at his Auction Rooms, King Street, Covent Garden, on July 9th.

Capture of Moths at Sea.—Some months ago my friend Dr. Charles Chilton kindly forwarded to me, in case they should be of interest, some moths taken at sea during his voyage from New Zealand to this country. He wrote as follows:—"During the morning of November 26th, a moist, hot day, while the 'Ionic' was a considerable distance off the coast of America, many small moths were blown on to the steamer, and many more were seen on the surface of the sea. This continued all the morning, and, though in less numbers, some were blown on during the afternoon, and a few were seen the next morning; our position at noon that day was 28° 24′ S., 46° 30′ W. One, or perhaps two, small land birds were seen on the ship at the same time." The position indicated is about one hundred miles off the coast of Montevideo. The insects proved to be almost all Geometrids, and I therefore passed them on to my friend Mr. L. B. Prout, who has been good enough to identify them as follows, *viz.*:—*Pleuroprucha insularia*, Guen. (1 male); *Amaurinia carnana*, Druce (8 males, 9 females); *Eupithecia*, sp. (worn) (1 female); *Doche-*

phora pilosa, Warren (2 females); *Eudule hesperina*, Burm. (1 female); *Macaria regulata*, Fab. (1 female); *Pantherodes pardalaria*, Guen. (1 female); *Bronchelia pudicaria*, Guen. (1 female). There was also a Tortricid altogether denuded and unrecognisable, and I think it very likely that there were other Micro-lepidoptera unnoticed; on these occasions the larger specimens are naturally selected. It will be seen that all are insects of weak flight, whilst the more robust and powerful insects are absent. I imagine the effect was due to a small whirlwind (which might naturally arise in such weather) carrying the insects up to some height and then drifting out to sea with them; it could not have been a strong one, as all active fliers were able to escape.—EDWARD MEYRICK; Thornhanger, Marlborough, June 17th.

ABUNDANCE OF THE LARVÆ OF ABRAXAS GROSSULARIATA AT HUDDERSFIELD.—I note from the current number of the 'Entomologist' (pp. 184 and 187) that Messrs. T. A. Blenkarn and L. W. Newman record the larvæ of *Abraxas grossulariata* as having been excessively scarce in the South of England this spring. Here there has been no lack of them. From one market-garden close to the town I have had six thousand larvæ and pupæ, and could probably have had twenty thousand from the same garden had there been time to pick them off, or to manage them when collected! They were full-fed unusually early this year, and at the beginning of May a schoolboy collected them for me in the evenings, &c., after school hours. On his earlier visits he said he could collect them faster than he could count them, then suddenly two pairs of cuckoos took up their quarters in the garden, when at once it became a race as to whether he or the cuckoos should get most! The cuckoos beat him by a long way, for in a few days they had practically cleared off the lot. The owner of the garden told me the cuckoos never left it, and seemed to be almost always feeding on the caterpillars, except when the two pairs were quarrelling over them, which, when they came near each other, they often did, and made plenty of noise over it! Probably they never before had such a time in their lives. Large numbers of the gooseberry-bushes were absolutely stripped of every vestige of leaf, and many of the currant-bushes also suffered terribly. I never before saw anything like it with this species.—GEO. T. PORRITT; Dalton, Huddersfield, June 6th, 1912.

MONOCHAMUS GALLOPROVINCIALIS, Oliv., IN HACKNEY.—On May 30th a living specimen of this longicorn was found in the analytical laboratory at Messrs. W. S. Bush & Co.'s works, Ash Grove, Hackney. In the morning, a boy picked up a duster off a bench, when the beetle nipped him. Mr. L. Slarm, one of the analysts, secured the insect, which was then forwarded to Mr. C. J. Gahan, who has kindly identified it as above. He also adds that he does not remember any previous record of the beetle having been captured in this country.—J. O. BRAITHWAITE; 18, Warren Road, Chingford.

[*M. galloprovincialis*, Oliv., is very like *M. sutor*, L., and it is quite possible that some of the records of the latter species really apply to the former. It is distinguished from *sutor* by having a naked triangular spot at the base of the scutellum, instead of a line extending right up to the apex, and by having the acetabula of the front coxæ closed, or very nearly closed behind. In *sartor* and *sutor* there is a distinct and rather wide gap between the epimeron and the hind end of the prosternum, so that the acetabula are always open behind.—C. J. G.]

Oviposition of Plusia moneta. — In reply to the Rev. W. Claxton's query on p. 181, I may say that the moths of the first brood (emerging about the end of June) deposit their ova on the flowers and flower-stems, and amongst the buds and capsules, of monkshood and *Delphinium*; those of the second brood (emerging in late August and September) probably oviposit on the seed-capsules or on late flowers, if any. I cannot say from experience whether this is so, but I have found very small larvæ feeding on the seeds of monkshood in late September in my garden here, in which the moth occurs commonly after Midsummer-day at the *Delphinium* flowers. The larvæ hybernate in the hollow stems of the plants near the surface of the ground, and if these be removed in winter I presume no larvæ would appear in spring. To this I attribute the fact that in some years my monkshood does not seem to be attacked, because I have removed the old stems, whilst the *Delphiniums*, whose stems were only cut down to within six inches of the ground, have been badly attacked. I should think it highly probable that the young larvæ would sometimes hybernate in the dead capsules, or even inside some of the seeds, and that Mr. Claxton's larva was curled up inside a seed, or at any rate was amongst the seeds when he got them, and so was on the spot when the seeds germinated. It seems to me extremely unlikely that the species would ever hybernate as an egg. I should like to take this opportunity of thanking the few correspondents who were good enough to respond to my request for records of this species in May, 1911.—C. Nicholson; Hale End, Chingford.

In your last issue (*antea*, p. 181) the Rev. W. Claxton suggests that the ova of *Plusia moneta* are laid " on the seed of the plant while in the pod." Last night I watched a female ovipositing; she laid her egg on the unexpanded bud of a *Delphinium* flower. I have no doubt that, like most Plusias, *P. moneta* passes the winter in the larval stage, but I will try to watch this particular egg to note when it hatches.—Percy C. Reid; Feering Bury, Kelvedon, June 19th.

Mr. Claxton's theory (*antea*, p. 181) that *P. moneta* lays its eggs on the seeds of *Delphinium* while yet in the pod is extremely interesting, but all the evidence at my disposal, though not conclusive, is against it. In my garden there is a single clump of monkshood (*Aconitum*), which comes up regularly year after year, and in due course flowers, but to the best of my belief in the last twenty years, and certainly in the last ten, it has never succeeded in setting any seed, even in spite of attempts at artificial self-pollination. Nevertheless, from 1904 to 1907 the young larvæ of *P. moneta* appeared in the tips as soon as the shoots were an inch or two above ground. The eggs that produced these could not have been laid on the seeds of the plant, for there were no seeds, and no other plants of either *Aconitum* or *Delphinium* in any of the neighbouring gardens. The old stems were cut off and the ground dug over, even the tubers removed in the autumn of the previous year; consequently, if the eggs are laid in the autumn, they must have been deposited in the ground about the roots of the plant, so that in the spring the newly hatched larvæ could find the springing shoots of the monkshood; or else, being laid on the plants, the eggs hatch in the autumn, and the young larvæ crawl down and hybernate in the crevices of the tubers. This, I admit, was my own theory, but it seems to be ruled out of court by Mr. Claxton's experiments. There yet remains the possibility that the moth itself hybernates, and deposits its eggs on the young shoots as soon as they appear. This theory seems perhaps the least incompatible with both Mr. Claxton's experience and my own, though I have no positive evidence that the moth does hybernate.—K. G. BLAIR; 23, West Hill, Highgate.

PLUSIA MONETA.—I am pleased to be able to record *P. moneta* for this district. I found one larva and six pupæ the first week in June, three of which have already emerged. Five were on *Delphinium* and two on monkshood.—ROBT. S. SMITH, Jun.; The Laurels, Downham Market, Norfolk.

COLIAS EDUSA IN BUCKS, AND SOME EARLY EMERGENCES.—On May 30th I was cycling from Great Missenden in the Wendover direction, when I saw a fine female *Colias edusa* by the roadside, evidently prospecting for a lucerne field, of which there are usually plenty in this neighbourhood. My last record for the country hereabouts is August 13th, 1904, north-west of Wendover. With the exception of the "whites," most of the common spring butterflies have put in a very early appearance this year. On April 20th *Euchloë cardamines* (males) were flying on the Chilterns near Kimble, and on the 21st at Pinner. *Pararge egeria* var. *egerides* was going over in the Bucks beech-woods on May 11th. On May 2nd *Cœnonympha pamphilus* was out here; *Chrysophanus phlæas* on the 9th. *Callophrys rubi* swarmed on the Chilterns on April 20th—both sexes, and in the same locality *Celastrina argiolus*. The latter butterfly has been commoner than I ever remember it in our garden, the flight lasting from April 19th to June 1st, when one or two worn females still haunted the hollies. On May 30th *Aricia medon* (*astrarche*) was well out on the Chilterns, with occasional *Pararge megæra* and *Augiades sylvanus*. *Thanaos tages* also was very common from May 11th onwards, *Hesperia malvæ* less so. The first *Polyommatus icarus* was out here on May 23rd (female, 25th), and individual males of *Cupido minimus* in Bucks on May 27th.—H. ROWLAND-BROWN; Harrow Weald, June 8th, 1912.

METRIOPTERA (PLATYCLEIS) ROESELII IN ESSEX.—On reading Mr. Campion's article in the 'Entomologist' for April (*antea*, pp. 117–18) it at once struck me that the description of this insect agreed very well with some examples I have taken on the North Essex coast during the past few years, and had labelled *P. brachyptera*. On comparing the specimens with the description in Mr. Burr's 'British Orthoptera,' the entirely pale margins of the pronotum seemed conclusive that it was really *P. roeselii*, and on my sending a specimen to Mr. W. J. Lucas, he confirmed the identification. The species seems to have been first met with in 1903, when a single male was taken, and one or more examples have occurred in most years since, the largest number being in 1909, when four were taken. The nymphs seem more in evidence than the adult insects, over a dozen being seen in 1909, when they were observed towards the end of June and in July—the dates for imagines being August 8th, 1904, August 30th, 1909, and most recently a single male on September 6th, 1911. It would therefore seem that the insect, though rare, is firmly established on the Essex coast, where it has probably occurred for many years, since the absence of wings would, as pointed out by Mr. Campion, render its dispersal by migration very difficult.—BERNARD SMITH HARWOOD; 62, Station Road, Colchester.

EARLY APPEARANCE OF BUTTERFLIES IN 1912.—Four specimens of *Callophrys rubi* were taken on April 23rd; a female specimen of *Chrysophanus phlœas* on May 13th, and a male *Cœnonympha pamphilus* on May 14th.—G. B. OLIVER; Tettenhall, Wolverhampton.

AGROTIS PUTA IN MAY.—While working lamps in Cambridge on May 11th I was surprised to observe a fair number of *Agrotis puta.* I took two males in excellent condition, and saw about half a dozen more. The only other Noctua taken was a venerable *Gonoptera libatrix*, though it was barely a fortnight since the disappearance of the Tæniocampids. I took *A. puta* here in June, July, and August last year, but have never before taken it in May. Presumably it is occasionally double-brooded, and in hot seasons, when the moths emerge early, the larvæ pupate in the autumn instead of in the spring, and so are ready to emerge some months before their normal date.—(Rev.) C. E. RAVEN; 4, Park Terrace, Cambridge.

SPRING LEPIDOPTERA, &c., IN ESSEX, 1912.—A few dates of first appearances noted here may be useful for comparison:—February 12th, *Hybernia progemmaria*; March 11th, *Anticlea badiata, Amphidasys prodromaria*; 21st, *Diurnea fagella*; 27th, *Brephos parthenias*; April 17th, *Lycæna argiolus*; 21st, *Euchloë cardamines, Anticlea derivata*; May 7th, *Platypteryx hamula*; 8th, *Hemerophila abruptaria, Rumia cratægata, Cilix spinula*; 9th, *Ligdia adustata, Pyrausta purpuralis*; 12th, *Stenopteryx hybridalis*; 13th, *Heliodes arbuti, Conchylis straminea*; 17th, *Chrysophanus phlœas*; 18th, *Euchelia jacobææ, Penthina pruniana.* Finally, the cuckoo was heard on April 19th, and the nightingale on April 20th.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

GYNANDROUS CYANIRIS ARGIOLUS.—I took a gynandrous specimen of *C. argiolus* on April 26th in Sutton Park, the right side being the male. This species was plentiful on April 22nd, and even at that date some of both sexes were badly worn.—G. B. OLIVER; Tettenhall, Wolverhampton, May 24th, 1912.

SPRING BROOD OF CYANIRIS ARGIOLUS.—This pretty little "blue" was quite common in our garden this spring, flying over holly-trees on sunny days in April and May. The first appearance noticed was on April 21st, when half-a-dozen were seen at one time.—JOSEPH ANDERSON; Chichester.

PYRAMEIS ATALANTA AND P. CARDUI AT CHICHESTER.—Notes on the occurrence of these butterflies in May appeared in last month's 'Entomologist' (p. 182). A worn specimen of *P. atalanta* was taken on an elm in front of the house; also in the same place and on the same date, May 13th, two *P. cardui*.—JOSEPH ANDERSON.

VANESSA ANTIOPA IN KENT, 1911.—It may be of interest to record the capture of *V. antiopa* last August at Chelsfield, Kent. The insect was taken by Master Arthur Rolls, and is unfortunately much damaged. I have to-day seen it among some insects he has.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

ACHERONTIA ATROPOS AT BRADFORD.—On May 23rd a very fine specimen of *Acherontia atropos* was picked up in the roadway at Low Moor, Bradford. The moth was in excellent condition when taken, although the weather was rough and wet at the time.—WM. BARRACLOUGH; Holly Hall, Low Moor, Bradford, June 15th, 1912.

DAPHNIS (CHÆROCAMPA) NERII IN KENT, 1911. — I was lately shown what would have been, had it fallen into "good entomological hands," a fine specimen of that rare visitor to Britain, *Chærocampa nerii*. It was taken by Mr. J. Diamond, of Chilmington, Great Chart, near Ashford, in his dairy late last autumn. The wings are still in fair condition, but the abdomen and thorax are almost denuded of scales; the antennæ and legs are gone. I have set the insect, and it is now in the possession of Mr. Gandy, of 63, Beaver Road, Ashford, to whom it was given by the captor. — CHARLES VIGGERS; 49, Sussex Avenue, Ashford, Kent, June 7th, 1912.

PHRYXUS (DEILEPHILA) LIVORNICA IN CORNWALL. — I have to record the capture of twenty more *P. livornica* between May 18th and 23rd also in South Cornwall. Several were females with fully developed ova.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey, June 6th, 1912.

PHRYXUS (DEILEPHILA) LIVORNICA IN NORTH WALES. — I have to report the capture by me of *D. livornica* (the striped hawk) at *Silene maritima* flower on May 25th, 1912. Is this a new record for North Wales?—F. SEYMOUR JACKSON; Hafod, Aberdovey, Merionethshire, June 2nd, 1912.

PHRYXUS (DEILEPHILA) LIVORNICA IN NORFOLK.—On May 22nd a nice specimen of *Deilephila livornica* was taken at rest on a shop window in this town. It is the first I have heard of from this locality, and is now in my possession. I see in 'The Field' that another specimen has lately been taken near Flax Bourton. I have seen several specimens of *Vanessa cardui* about lately in this district.—F. H. BARCLAY; The Warren, Cromer.

SPILOSOMA URTICÆ IN ISLE OF WIGHT.—I am glad to be able to record the capture of a female specimen of *S. urticæ* (water ermine) in Sandown Marshes, May 28th. Only one specimen has been taken in the Isle of Wight before, and this is now in the collection of Mr. J. Taylor, of Sandown. Another capture of interest was a very fine specimen of *Zygæna trifolii* var. *confluens* in Brading Marshes, taken on May 29th.—STANLEY A. BLENKARN; "Norham," Cromwell Road, Beckenham, May 29th, 1912.

DIAPHORA MENDICA IN IRELAND. — I obtained here yesterday a typical female specimen of *Diaphora mendica* (pure silky white), with five spots on each fore wing, and apparently newly emerged. She deposited a few ova, but I fear that these are infertile.—HUGH F. STONEHAM; Kinsale, co. Cork, May 24th, 1912.

COLLECTING IN WESTMORLAND, 1911.—June 12th was a fine, bright day, and *Lycæna icarus* (male) was out in swarms. The disparity in size between examples of the same brood from the same locality is astonishing. Our largest males, when set, measure exactly 1⅜ in. from tip to tip—the smallest (both sexes) exactly 1 in. Some females are almost as "blue" as the males (except of course the extreme margins of the wings), but in their case the blue has very often a pronounced lilac tinge. Occasional specimens (female) have a distinct bluish-white wedge-shaped mark on the upper side of the disc of the hind wing, and examples with whitish patches near the apex of the fore wing are somewhat commoner. The same day I found males of *Augiades sylvanus* plentiful and in beautiful order. Several males and one female of *Diacrisia sanio* were netted. A dozen ova from the latter hatched very quickly, and the young larvæ fed so vigorously that I had hopes of rearing the second brood, but in this I was disappointed. After reaching a certain stage their appetite failed, and they are now, after trying unsuccessfully to hybernate, all dead. Mr. Holmes from a similar number of ova obtained from a female taken *a month later* had one larva go through, and that produced a fine male on August 29th. One wonders as to the cause of such erratic behaviour, for it would be hard to imagine a season theoretically more suited to the production of a second brood of this species. June 13th saw a new batch of *C. typhon* emerging, and I was fortunate in netting a fair series. The day was windy, and every individual had to be "kicked up." After battling with the breeze for a moment or two, they would be swept away for fifty yards before they could alight, and then could be marked down and generally captured. A number of perfect female *A. sylvanus* and one fresh *Hyria muricata* were taken on the following day. I noticed some *L. icarus* resting on grass-heads at 6 p.m., and as they were still in the same position at 9.30 p.m., assumed that they had at that hour begun to take up their positions for the night. Quite a number of *C. pamphilus* were observed at the same time, resting upon the yellow centre of the ox-eye daisies.

June 16th, a dull day with a strong wind, found me again on the "moss." *C. typhon* would not rise at all. A storm was threatening, and they seemed to know it. I have noticed that in bad weather they creep low down amongst the grasses, after the manner of *Erebia cassiope*. On some high-lying marshy ground (1000 ft.) freshly emerged males of *A. selene* were found fully three weeks later than on the lowland limestone, although here we noticed projecting from a sallow trunk two freshly vacated pupal cases of *T. crabroniformis*, a species we are accustomed to take in early July! The vagaries of the season have been bewildering. About this date I had the mortification of losing a fine brood of *Lithomoia solidaginis* through diarrhœa, caused, I believe, by the birch carelessly supplied them being saturated with honeydew. Honeydew was greatly in evidence during the summer months, and consequently "sugar," so productive last year, was a complete failure. Mr. Mallinson reported numerous captures at dusk on *Silene* flowers—*C. porcellus*, *C. umbratica*, *D. cucubali*, *P. iota*, *P. pulchrina*, and *P. interrogationis*. Three *Pheosia dictæoides* appeared in the pupa-cage on June 20th. There is something peculiar about this insect. Mr. Mallinson took it freely at light in early May, and again in August. Yet, out of the seventy odd pupæ carried over winter by the Kendal collectors, the above three were the first to emerge. More dribbled out during July, but fully half the total number are lying over. I cannot recall ever breeding or catching a May specimen here, although Kendal is only nine miles distant from Windermere. *E. cæsiata* was out and in good condition on June 23rd, and on the 27th I found, by searching poplar, nine newly hatched *S. populi*, three *G. libatrix*, and one *P. tremula*, the last, unfortunately, turning out to be ichneumoned. An enterprising specimen of *Oporabia filigrammaria* emerged in the pupa-cage (kept outside) on June 27th—a further proof of the early character of the season.—Frank Littlewood.

(To be continued.)

SOCIETIES.

Entomological Society of London. — *Wednesday, April 3rd*, 1912. — The Rev. F. D. Morice, M.A., President, in the Chair.— The following gentlemen were elected Fellows of the Society:— Mr. Henry Hacker, Queensland Museum, Bowen Bridge Road, Brisbane, Queensland; Mr. Cyril Engelhart Latour, Port of Spain, Trinidad, British West Indies; Signor Orazio Querci, Macerata, Marche, Italy. — The Council having been invited to elect Delegates to represent the Society at various functions, the following had been elected:—For the Centenary Celebration of the Philadelphia Academy of Natural Sciences, Professor Comstock and Dr. Holland; Professor Fernald, who had also been elected, was unable to attend; for the First Eugenic Congress, in July, Professor Bateson; for the 250th Anniversary of the Royal Society, in July, the President; for the International Congress of Entomology, in August, the President, the Rev. G. Wheeler, Secretary, and Messrs. G. T. Bethune-Baker, H. Rowland-Brown, and the Hon. W. Rothschild.—Mr. G. T. Bethune-Baker exhibited a specimen of *Cyclopodia hopei*, Westw., a parasite on the Indian flying-fox; this was itself parasitized by an Acarid of the genus *Gamasus*, there being no less than seventeen of this small species on one specimen of *C. hopei*.— There being no other exhibits and no papers to be read, the President said that he thought it would be a good opportunity to discuss the important subject of Nomenclature, and a long discussion took place in which many of the Fellows present took part. Eventually Mr. Turner proposed that a small Committee be appointed to consider the subject of Nomenclature and report to the June meeting, with a view to the coming International Congress. This was seconded by Mr. A. E. Gibbs, and carried *nem. con.* The following Fellows were proposed as forming the Committee, and the names being put from the Chair were unanimously accepted:—Mr. G. T. Bethune-Baker, Dr. T. A. Chapman, Messrs. J. H. Durrant, H. J. Turner, C. O.

Waterhouse, and Rev. G. Wheeler, with power to add to their number.—George Wheeler, M.A., *Hon. Sec.*

The Manchester Entomological Society.—*January 3rd.—Annual Meeting.*—Election of Officers for 1912.—Mr. W. Buckley gave the Presidential Address for the year—"Entomology and the Microscope," and illustrated his remarks with a large number of beautiful slides.—Mr. J. H. Watson exhibited *Saturnia cephalariæ* var. *harversoni*, from Higher Armenia; in a pupa kept for two years he had found a living dipterous parasite.—Mr. R. N. Earwaker showed the larvæ (feeding on the fungus *Polyporus radiatus*) and the imago of the beetle *Orchesia micans*, from Cheltenham.—Mr. B. H. Crabtree showed a series of *Luperina gueneei.*—A. W. Boyd, M.A., *Hon. Secretary.*

RECENT LITERATURE.

British Butterflies. By A. M. Stewart. London: Adam & Charles Black. 1912. Pp. i–viii, 1–88. (Peeps at Nature Series. Edited by Rev. C. A. Hall.)

Although this little book deals with a subject already much and often handled, we venture to say it will admirably fill a place not yet occupied. It contains some ninety pages of attractive letterpress, not overburdened with detail, but nevertheless setting forth all that is necessary to the tyro. One could only wish that the life-histories had been more fully dealt with in some species. The eight coloured plates produced direct by the three-colour process are really marvellously well executed, and lose nothing in being somewhat reduced; they should entirely do away with any difficulties of identification—even those of the merest novice. It is easy to see that the introductory chapters are the work of a thoroughly practical entomologist; but we should have liked to see the tracing-cloth method of setting at least mentioned, being as it is at least as rapid and quite as effective as the Paisley method.

N. D. R.

How to Use the Microscope; a Guide for the Novice. By the Rev. C. A. Hall. London: Adam & Charles Black. 1912. Pp. i–viii, 1–88.

This useful little book on the microscope is apparently uniform with the 'British Butterflies' already noticed, and equally well got-up. Although the twenty plates, taken direct from photo-micrographs, are of course none of them in colours, yet, taken in conjunction with the drawings in the text, they cover a sufficiently wide and varied range of subject to interest the uninitiated, for whom the book is intended, in at least a few branches of the science of microscopy. The text, too, contains a wealth of useful advice and instruction, and we are glad to see a very large proportion of it has been devoted to the explanation of the apparatus necessary and of its uses, and also of the chief methods of preparation. These, after all, are the points upon which the novice needs help; for the application of them he can usually be trusted to look after himself. We heartily recommend the book.

N. D. R.

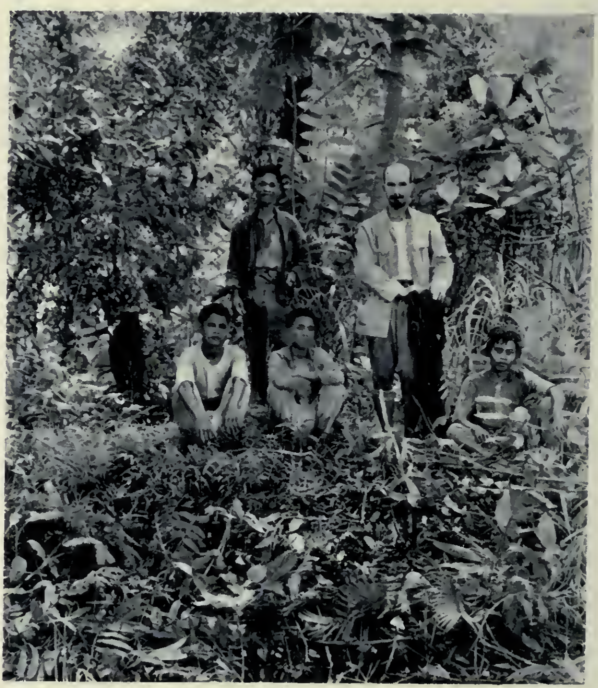

Fig. 1.

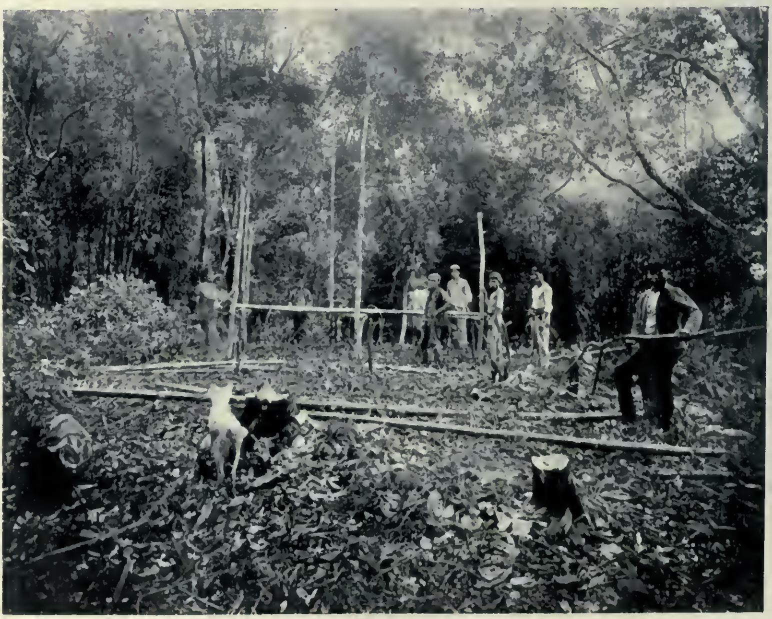

Fig. 2.

"WHERE WALLACE TROD."

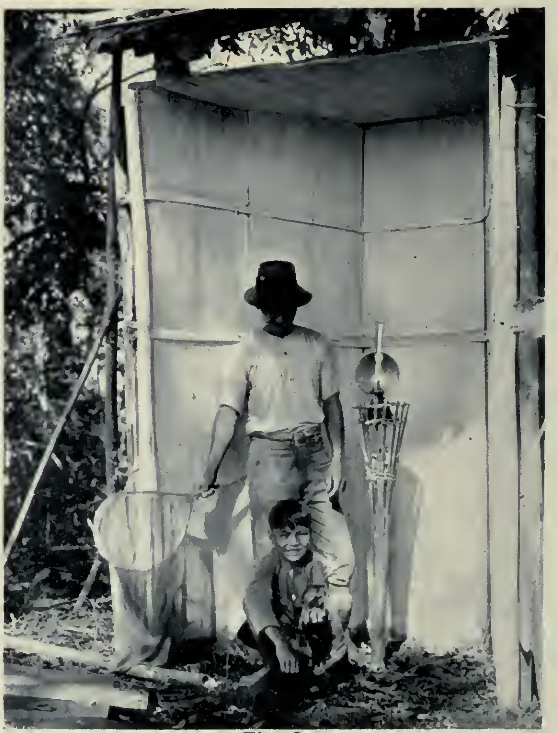

Fig. 3.

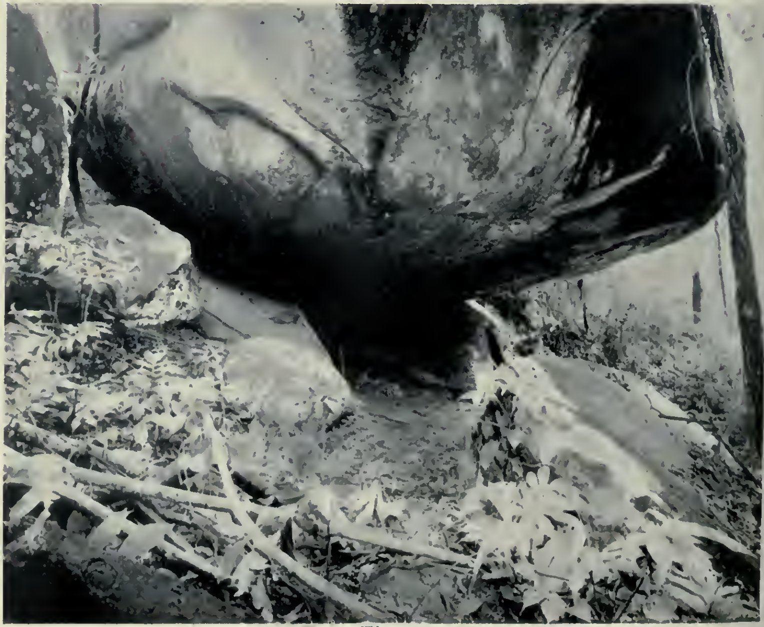

Fig. 4.

"Where Wallace Trod."

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"WHERE WALLACE TROD": BEING SOME ACCOUNT OF AN ENTOMOLOGICAL TRIP TO MT. SERAMBU, SARAWAK, BORNEO.

By J. C. Moulton, B.Sc., F.L.S., F.Z.S., F.E.S.,
Curator of the Sarawak Museum.

(Plates V. & VI.)

Just as the Galapagos Isles will always be famous for the birth of Darwin's great theory of Natural Selection, just as Ternate will always share this fame as the birthplace of the same idea to Wallace, so too, should Sarawak be remembered in connection with Wallace's earlier essay on the Origin of Species,* which foreshadowed that written three years later in Ternate, and read before the Linnean Society in conjunction with Darwin's essay in 1858.

During Wallace's travels in the Malay Archipelago, lasting over eight years, the great naturalist spent fifteen months in Sarawak, nine of which he spent at Simunjan, which he describes as the best collecting-ground for insects found in all his travels, and, as most readers will remember, he gives some astonishing figures to illustrate this. Besides this, he also spent four weeks on a mountain called Serambu, not far from Kuching, the capital of Sarawak; this was from December, 1855, to January, 1856. His essay was written in February, 1855, at Santubong, the Sarawak seaside resort, and was published in September, 1855. As he tells us in his 'Life,' 1905 (p. 354), through many evenings and wet days in solitude he used to "ponder over the problem which was rarely absent from my thoughts," and there is little doubt that the quiet time spent on Peninjau (a spur of Serambu) enabled him to put in many quiet hours of wrestling with the all-absorbing riddle. It was therefore with feelings of the liveliest interest that I first beheld Mt. Serambu, just three years ago (February, 1909), and had soon determined to go to that mountain, find the very spot, if possible, where Wallace lived, spend the same months there as Wallace did, and devote myself to catching insects just in the same way that he did. To hopes of thinking out another epoch-making theory I did *not* aspire, but I did hope that my collection of insects would not fall far short of those recorded by him, and in this I was not disappointed. Circumstances prevented me from going to Serambu until January of this year (1912), and it was with the keenest anticipation that I started from Kuching at 3 p.m. on January 19th in the Borneo Company's little steam-launch 'Patricia.' My companions for the trip were Mr. Harrison W. Smith, who was as desirous as I "to step where Wallace trod," two museum collectors (Sea-Dayaks), two Land-Dayaks, and our two Chinese boys. A three hours' journey up-river in the launch brought us to Busau, once a populous place on account of the antimony works. From here we walked some three or four miles to a place called Paku, where we had arranged to spend the night in the Government bungalow. Unfortunately, as the sun set soon after 6 p.m., we soon found ourselves stumbling along a slippery path in the dark, which was made no nicer by a heavy downpour of rain. Our luggage and retinue followed on little trolley-cars, arriving about 10 p.m., after successfully negotiating sundry little differences of opinion between the car and the line, which, while adding character to the line, at the same time serve to distinguish it from our memories of the London to Bath portion of the Great Western Railway.

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* "On the Law which has Regulated the Introduction of New Species," published in 'Annals and Magazine of Natural History,' September, 1855, and reprinted as Essay I. in 'Contributions to the Theory of Natural Selection,' by the same author, 1870.

At Paku the mountain faced us due east, and we learnt that there were two sites of former bungalows, one to the south, where a resident of this district used to spend some days, and the other on the northern end of the mountain on a spur called Peninjau; this was the site of the old bungalow built by the Rajah. The Dayaks who had come down to fetch our baggage explained that nothing was left of either of these bungalows, and that both sites were all overgrown, especially the latter, which they said was indistinguishable now from the old jungle. However, this last was our objective, so off we started that morning, and after an hour and a half of hot walking we came to a Dayak village on the lower slopes of the mountain; here we deposited our baggage, and, taking three men with us, Mr. Smith and I proceeded on up to "explore," or rather to see how far the Dayaks could be believed in their account of the place. Just above the village the path lay over some huge boulders, and these had been bridged by a series of bamboos placed end on; some of these were notched to give a foothold, others were not; to some were attached hand-rails, to others not. Having respectfully and successfully negotiated this portion of the Dayak highway, we came by a steep but easier path to a deserted village, which, situated as it was on the steep slope of the hill, surrounded by the stately trees characteristic of old jungle, and itself overgrown by a quick-spreading green garment of creeper and undergrowth, made a pretty picture, and my friend was not slow to take the opportunity of photographing it. A few minutes further brought us to the end of our journey—a fine mangosteen tree loaded with some of the most delicious fruit imaginable. Our Dayak guides said this was where the bungalow used to be, and after a little search we discovered the six posts on which the raised floor had rested; between them grew a fine young tree just three feet in circumference at the base, and the whole place was, as the Dayaks had said, just like ordinary jungle. Except for those six posts and two boards used for steps, not a trace of the bungalow was left.*

We returned that afternoon and slept the night at the Dayak house. Next morning we ascended the hill again, this time accompanied by twenty-one Dayaks, who, after carrying up our baggage, spent some hours clearing the site and building us a house. This was built on much grander lines than is usual for these jungle shelters, and for those unacquainted with this style of domicile the following details may be of interest:—Six poles were first driven into the ground, three to mark each end of the house, which then measured 13 ft. × 10 ft. Two feet above the ground poles were tied across these ends, and others laid at right angles to them, supported by more cross poles on forked stakes underneath. Bamboos were then laid close together to form a floor, while the walls were formed of the same useful material split lengthwise, and then more bamboos laid across the top supported our "kadjang" roof.† We were a bit short of these "kadjangs," but luckily my friend had brought a tarpaulin, so we were able to make our little hut very fairly watertight.

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* Wallace's description of his visit there is given in his 'Malay Archipelago' (10th ed. 1902, pp. 63–67). I quote the following lines descriptive of the place:—

"This is a very steep pyramidal mountain of crystalline basaltic rock about a thousand feet high, and covered with luxuriant forest. There are three Dayak villages upon it, and on a little platform near the summit is the rude wooden lodge where the English Rajah was accustomed to go for relaxation and cool fresh air. It is only twenty miles up the river, but the road up the mountain is a succession of ladders on the face of precipices, bamboo bridges over gullies and chasms, and slippery paths over rocks and tree-trunks and huge boulders as big as houses. A cool spring under an overhanging rock just below the cottage furnished us with refreshing baths and delicious drinking water, and the Dayaks brought us daily heaped-up baskets of Mangusteens and Lansats, two of the most delicious of the subacid tropical fruits."

† "Kadjangs" are palm-leaves sewn together in a large square; they are in continual demand for hut and boat coverings—in fact, anything which wants a temporary protection from the rain; they cost about fourpence each.

Except for the "kadjangs" and tarpaulin which we brought from Kuching, all the materials for the house (which contained no nail or cord) were provided by the jungle.

A little way below the house was a huge overhanging rock, under which trickled a tiny stream; a bamboo split down the middle formed an excellent water-pipe, carrying the water to a place under which we could stand and bathe.

Mindful of Wallace's warnings in the Malay Archipelago, and knowing from my own experience how difficult it is to catch moths in a native-made hut roofed with leaves, I brought some old packing-cases from Kuching, and these were brought up the hill in sections by Dayaks. When put together and given a coat of whitewash they formed a very serviceable moth-trap. The rough measurements of it were: 7 ft. high; across open front, 4 ft.; across back (boarded), 2 ft.; sides, 4 ft.; a good reflector lamp placed on a split bamboo inside this kept us well supplied with moths each night.

According to our aneroids, the height above the sea-level for this place was just under 1000 ft., and the summit of Mt. Serambu was 1340 ft. The temperature in the shade of our hut averaged between 71°–77° Fahr.; on one cold afternoon it went down to 69°, and for two days it never went above 73°. These temperatures were almost suggestive of the North Pole after those registered at Kuching, where 80°–90° is the usual range, with an occasional rise to 96°. As the wet monsoon lasts from October to March, we could hardly expect to have other than a wet spell in January for our trip, and for the last portion, at all events, of our stay there we had our full share of wet weather, which accounts for the relatively small number of insects caught in the daytime, although it made no difference to the numbers captured at night.

On the 21st we spent our first night on the spot where Wallace had dwelt just fifty-six years before. Jungle life has been described so often before that there is no need for me to detail ours, though let me remark that the best accounts give but a very small idea of the unique charm of life in such surroundings. With the exception of a visit paid by Mr. Smith and myself to some caves in a neighbouring hill, our party spent just a fortnight collecting on and round this place. Mr. Smith unfortunately contracted fever, and had to return to Kuching on the 29th. The remainder of us stayed up there until February 2nd, descending on that day by the Peninjau side to Siniawan, which was a good deal shorter than the Paku route.

All inquiries of the older Dayaks failed to elicit any positive recollections of Wallace's visit here. All they remembered was that the first Rajah, Sir James Brooke, had a bungalow built on this site (which site, by the way, they say he purchased from the Peninjau Dayaks for one cannon), and that he came here often accompanied by European friends,* and that the present Rajah, Sir Charles Brooke, did the same. Only a few remembered the Chinese rebellion in Sarawak, which took place in 1857, and recollections of that great event seem to have swamped all memories of events before it; so that Wallace's visit in January, 1856, must now be relegated to that great host of events which took place in the irreclaimable past no longer within the memory of man.

> "Eheu fugaces, Posthume, Posthume,
> Labuntur anni."

(To be continued.)

NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

By F. W. Edwards, B.A., F.E.S.

(Published by Permission of the Trustees of the British Museum.)

(Continued from p. 195.)

3. *O. annulipes*, Mg.—Proboscis with a rather ill-defined pale band in the middle. Head scales yellowish. Scales of mesonotum dark brown in the middle, rather bright yellow at the sides. Segments of abdomen with yellowish basal bands, covering nearly half of each of the segments 3–5, but narrower on the remaining segments; apical portion of segments mainly dark brown, but with scattered pale scales. Wings and legs speckled with light and dark scales, but femora nearly all yellow behind. *O. annulipes* is very much like *O. maculatus* in general appearance, but can be distinguished in the female sex without much difficulty by the characters given in the key. The males are more easily separated by the structure of the genitalia. Rough figures of the genitalia of both the species are given. In *O. annulipes* (fig. 1) the harpes (basal appendages) are long and strap-shaped, and in *O. maculatus* (fig. 2) they are shorter, and provided with a large membranous expansion near the tip. Average length, 7–8 mm.

The British Museum possesses specimens from Angmering, Sussex (*Rev. A. E. Eaton*); Longner Hall, Shrewsbury (*R. F. L. Burton*); and Rollesby, Norfolk (*G. H. Verrall*).

I have no doubt that this species is correctly named, as it answers quite well to Meigen's description. Ficalbi, however, states that the abdomen is entirely yellow; this may very likely be a variation of our British species, or it may be another nearly allied form. A similar variation—*i. e.* the reduction in the number of dark scales on abdomen and wings—occurs in *O. nemorosus*. Ficalbi's *C. annulipes* has been redescribed from Finland by Theobald as *C. flavescens*, and Blanchard has renamed it *C. arcanus*. M. Goetghebuer records *C. annulipes* from Belgium (Ann. Soc. Ent. Belg. 1910, p. 84), but states that the female has simple claws and median rings on the metatarsi. Perhaps his species is *T. richiardii*, Fic.

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* Sir Spenser St. John visited the place in 1851–2, spending some months there in all (see his 'Life in the Forests of the Far East,' 2nd ed. 1863, vol. i. pp. 162–169). Ida Pfeiffer visited the Dayak villages on Serambu in December, 1851 (see her account of it in 'A Lady's Second Journey round the World,' 1856, pp. 50–55). The distinguished botanist, O. Beccari, spent a week there in 1865 (see his 'Wanderings in the Great Forests of Borneo,' 1904, pp. 54–60).

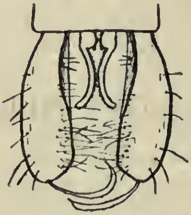


Fig. 1.

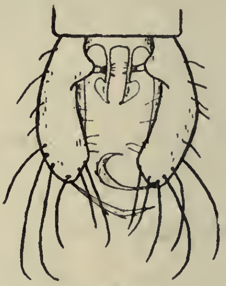


Fig. 2.

Fig. 1.—*Ochlerotatus annulipes*, Mg. Male genitalia (diagrammatic).
Fig. 2.—*O. maculatus*, Mg. Male genitalia (diagrammatic).

4. *O. maculatus*, Mg.—Thoracic scales mainly dark brown, but a variable number of yellowish white ones are present. These latter are usually found on the margins of the mesonotum, in front of the scutellum, and as a pair of thin pale lines of variable length, sometimes reduced to a pair of rather prominent whitish spots near the middle of the thorax. Pale bands of abdomen often very indistinct in the female, represented by median basal spots on some or all of the segments; the whole dorsal surface of the abdomen, like the wings and legs, is speckled over with pale scales. Average length, 7–8 mm.

Widely distributed and probably common.

Synonymy.—This species is usually known as *Culex cantans*, Mg. Meigen, however, states that his previously described *C. maculatus* is only the male of *C. cantans*. Stephens's *C. fumipennis* is generally accepted as a synonym of *C. cantans*, but I think wrongly. Stevens stated that the "white rings at the base of each joint of tarsi" were "nearly obsolete"; this would apply very well to *T. morsitans* or *T. theobaldi*, but not to *O. cantans*. As, however, it would be impossible to decide which of these two *Theobaldias* Stephens had, and as no British species known to me can be said to have the "wings obscure," I do not revive this old name. Theobald's *Culicada waterhousei* is certainly only *O. maculatus*, as the genitalia of the type (though *not* of the figure) agree well with those of typical *maculatus* as figured by Meijere, and roughly in this paper. *C. waterhousei* agrees with all other British *Ochlerotatus* except *O. lateralis* in having the hind claws toothed.

5. *O. salinus*, Ficalbi.—Proboscis and palpi dark brown with scattered pale scales. Scales of thorax uniformly reddish brown. Abdominal segments with distinct basal pale bands, dark brown on the apical three-fourths, with numerous scattered pale scales. Wings and legs (even the tarsi) speckled with light and dark scales. Average length, ♂ 6·5 mm., ♀ 5·5 mm.

Apparently chiefly a sea-coast species; the British Museum specimens are from Worthing (*Rev. A. E. Eaton*); Walton-on-the-Naze, Essex; Studland, Dorset, and Torpoint, South Devon (*Lt.-Col. Yerbury*); Dartford, Kent (*F. W. Terry*).

Synonymy.—This species was originally described by Ficalbi as distinct from *O. nemorosus* owing to the absence of silvery-white knee-spots, which, according to the descriptions of Meigen and Schiner, characterise *O. nemorosus*. Subsequently Ficalbi examined a specimen of *O. nemorosus* named by Schiner in which the pale knee-spots were not silvery-white, and so sank his *C. salinus* as a variety, differing from *nemorosus* in the genitalia. I feel sure it is a totally distinct species, both by coloration and habitat. In the writer's synopsis of African Culicidæ this species is wrongly referred to as *O. nemorosus*. Theobald's *Culicada terriei*, described from a single specimen, is nothing but a small specimen of this species.

6. *O. diversus*, Theo.—Scales of head and thorax mostly yellowish brown; on the thorax are a median pair, almost touching in the middle line, and a short lateral pair of longitudinal dark brown stripes. Proboscis and palpi dark brown, with very few light scales. On the wings the light scales are practically confined to the mediastinal vein. The legs are less speckled than in *O. salinus*; the femora are entirely yellowish behind, except at the extreme tip; the tibiæ are mostly pale; the last four joints of the tarsi entirely black-scaled. Average length, 6–7 mm.

Apparently a common species.

This species answers in many respects to Ficalbi's description of what he takes to be the *C. ornatus* of Meigen, and it is certainly difficult to believe that it should have been undescribed until 1901. But Ficalbi's description does not correspond with the colouring of the abdomen found in British specimens, and I have been unable to satisfy myself that *O. diversus* has been described under any older name. Theobald's *C. nemorosus* var. *luteovittatus* is, however, a synonym, as I have proved by comparison of the types.

7. *O. nemorosus*, Mg.—Head scales rather light yellowish brown; thoracic scales forming a broad deep brown band in the middle, extending almost to the scutellum; at the sides of this band, which is usually quite sharply defined, the scales are concolorous with those of the head. The pale bands of the abdomen are rather variable in shape, but always tend to be contracted in the middle (or expanded at the sides). The apical dark brown portions of the segments are entirely without any

pale scales. The femora are pale behind and over the greater part of the basal half, dark in front and above. Tibiæ and tarsi usually entirely dark brownish black, but there may be pale scales on the tibiæ and metatarsi. Wings entirely without pale scales. Average length, ♂ 6·5 mm., ♀ 5·5 mm.

A common sylvan species. Very abundant at Oxshott, Surrey; and at Studland, Dorset ("very venomous," according to Lt.-Col. Yerbury). I have also seen specimens from the New Forest; Burnham Beeches; Tophins (Aberdeen); North Sutor (Cromarty); Nethy Bridge (Inverness), &c.

Synonymy.—This species is without any doubt the *Culex concinnus* of Stephens, a name which, for some unexplained reason, has been omitted from all the catalogues. Curtis's *C. guttatus* has been commonly regarded as synonymous with *O. nemorosus*, but the figure plainly shows that it is not this species, but *O. lateralis*. The form which Theobald calls var. *detritus* (Hal.) is really typical *nemorosus*; Haliday himself stated that his *C. detritus* was only *C. pipiens*, but a specimen in the British Museum collection, named *C. detritus* by Walker, is really *O. lateralis*. Dr. S. Bengtsson very kindly sent me specimens of three of Zetterstedt's species (*C. fusculus*, *C. nigripes*, and *C. nigitulus*) to examine; those of *C. fusculus* seemed to be very much rubbed specimens of this species, and though the descriptions do not correspond, *C. fusculus* may probably be taken to be a synonym of *C. nemorosus*. One of Zetterstedt's specimens showed traces of pale bands on the abdomen. *C. nigripes*, Zett., is extremely similar, but the scales of the head and thorax are all very deep brown, except for a few in front of the wing-base, which are whitish. Theobald's *Culicada sylvæ* (originally described from two New Forest specimens as a variety of *C. nigripes*) is probably this species. Mr. R. C. Bradley has kindly re-examined the types for me; he says that the hind claws of the female are distinctly toothed, and indicates that the cross-veins are separated by nearly the length of the posterior. Thus the two main characters by which this specimen was supposed to be distinguished are not really present. The palpi of the male are described as being a little shorter than the proboscis, a character found in *O. lateralis*; the other characters of this male (a worn specimen) do not, however, correspond with those of *O. lateralis*.

8. *O. lateralis*, Mg.—Scales of head mostly whitish, but two large patches of black ones. Thorax black; sides broadly whitish, a line of whitish scales down the middle, and several short lines of the same colour in front of the scutellum. Abdomen violet-black above, with conspicuous white lateral spots. Legs black; basal half of hind femora yellowish-white; distinct silvery-white knee-spots. Wing-scales all dark. Hind claws simple. Male palpi a little shorter than the proboscis, and scarcely swollen at the apex. Average length, ♂ 5 mm., ♀ 6·5 mm.

Common in the South of England.

Synonymy.—This is the species described by Curtis as *Culex guttatus*, and by Rondani as *C. albopunctatus*.

(To be continued.)

BRITISH NEUROPTERA, 1911.

By W. J. Lucas, B.A., F.E.S.

With the advent of the new year the Neuropterist may commence out-door operations, and the capture of more species than one may at once reward him for his trouble. On January 29th I met with my first example in 1911—a specimen of *Hemerobius stigma* (one of the Brown Lace-wings), which was beaten from a small Scotch-fir by the margin of the Black Pond on Esher Common, Surrey. The species is, however, continuous as an imago, and I believe I have taken it in that condition in every month of the year.

Of the **Sialidæ** (Alder-flies) I have but one record, a male of the common *Sialis lutaria*, which was taken at Lochinver in Sutherland by Col. J. W. Yerbury on June 23rd.

Personally I made no captures of the **Raphidiidæ**, though I sought for specimens near the Black Pond, Esher, on June 4th, and found pupa skins. These insects seem to be upon the wing for quite a short period. Lieut.-Col. Nurse, writing on June 8th, said that he found a pupa and two larvæ of *Raphidia notata*. The latter two duly pupated, but unfortunately they were thrown away by mistake. He also obtained a small larva of *Raphidia* in a spruce-fir cone. In May Mr. G. B. Oliver of Wolverhampton sent me a living female of *R. xanthostigma* and a pupa-case, saying that the imago was found on the 14th of the month, apparently freshly emerged, near the empty case on an oak-trunk in Sutton Coldfield Park. Later he sent me another living female, which fell from oak when he was larva-beating on June 6th at Sutton Coldfield. This species closely resembles the much scarcer one, *P. cognata*.

Next come the **Hemerobiidæ**. While I was on a visit to the New Forest in April, Mr. D. Sharp caught in Blackwater near Rhinefield, and gave to me, three larvæ of *Osmylus chrysops*, the finest of our Neuroptera. After I had left the Forest he wrote to me on May 13th, saying:—"I have been able to get only one more larva of *Osmylus*. It appears to be an amphibious insect, not aquatic; it runs, not swims. It puts out from behind two delicate tubes, armed with some curious processes. I do not recollect having seen any special remark concerning them. The figure in the Cambridge Natural History shows them, but it is a poor figure, and the antennæ too are different from those of my specimen. I think the tubes assist in locomotion, but this can scarcely be their primary function." Of *Sisyra fuscata*, the interesting little creature whose larva feeds in freshwater sponge, I have two records. One specimen was taken at Lochinver on July 11th by Col. Yerbury, and another was captured at Barnham in Suffolk by Lieut.-Col. Nurse.

Of the typical genus *Hemerobius* (Brown Lace-wings) a number of species have been noted:—*H. micans*, three at Ampton, Suffolk (Nurse). *H. nitidulus*, May 21st, Oxshott, Surrey, (W. J. L.); five at Ampton and Troston, Suffolk (Nurse). *H. humuli*, in Sutherland, three at Lochinver, June 23rd, and one at Loch Assynt, June 2nd, a very dark form (Yerbury); two at Ampton (Nurse). *H. lutescens*, four at West Stow, Suffolk (Nurse). *H. orotypus*, two at Spey Bridge, July 31st, and one at the same place, August 2nd (Yerbury). *H. nervosus*, four at Spey Bridge, July 31st, one at Lochinver, June 27th, one at Grantown-on-Spey, August 17th, and one at Loch Assynt, June 9th (Yerbury); four at Ampton (Nurse). *H. subnebulosus*, one sent me about May 5th, caught by Mr. P. Richards in his garden at Kingston-on-Thames, where there was a fir-tree. *H. stigma*, Esher Common, January 29th, and Oxshott district, May 21st (W. J. L.). *H. concinnus*, Esher Common, June 4th (W. J. L.).

Three species only of the family **Chrysopidæ** (Green Lacewings) have been noted, and all belong to the typical genus *Chrysopa*. *C. flava*, one in the evening of July 17th in a garden at New Malden, Surrey. *C. septempunctata*, an example caught in Surbiton, Surrey, May 27th (A. Dadswell). *C. perla*, Esher Common, June 4th (W. J. L.).

We now come to the last family, **Panorpidæ** (Scorpion-flies). The first noticed were a male and two females of *Panorpa germanica*, May 21st, in the Oxshott district. A number of specimens of the same species were taken by Col. Yerbury in the north of Scotland—one male at Dingwall, May 27th; two males and a female at Dingwall, May 29th, when they were in fair numbers; one female, July 12th, at Lochinver. These Scotch specimens form a nice series, extending from the normally spotted condition to a practically immaculate form, not unknown from the same region. Lieut.-Col. Nurse captured the species at Ampton, a teneral female, May 12th, and another female on May 18th; at Timworth, West Suffolk, a teneral female, May 21st, and two males and a female, mature, on the same day; also at Timworth, a male, June 15th, two males and a female, May 30th, and a female, August 27th; at Bradfield, West Suffolk, three males, May 23rd. Mr. E. Whitehead took it at Hollingworth Lake, Smithy Bridge (? Cheshire) on June 20th. *P. communis* was taken (a female) near Oxshott, on July 2nd, and a female in the New Forest on August 2nd (W. J. L.); at Reach Ditch, Cambridgeshire, three females, July 11th; at Chippenham, Cambs, a male, June 16th, and at Timworth in August a brownish male (Nurse); in Delamere Forest, Cheshire, July 3rd (Whitehead). *P. cognata* was taken at Livermore, West Suffolk, a male and a female, July 2nd [and two males and a female, August, 1905, at Timworth] (Nurse). The unicolorous rostrum, the shape of the antepenultimate segment of the abdomen, and the form of the appendages, very clearly pointed to this, the scarcest of our species of *Panorpa*.

Notes on British Neuroptera (as well as on British Orthoptera and Odonata) during 1912 will be welcomed by the author of this note.

Kingston-on-Thames: June, 1912.

A NEW STRAWBERRY APHIS.

By Fred. V. Theobald, M.A., F.E.S., Hon. F.R.H.S., &c.

Myzus fragariæ, nov. sp.

Apterous Viviparous Female. — Very pale green, often semi-transparent. Head, thorax, and abdomen covered with capitate hairs. Antennæ as long as the body; basal segment rather large, with a thick blunt swelling on the inner side; second segment small; third long, not quite as long as the next two, which are equal; the sixth longer than the fourth and fifth; the first with several, the second with two large and some small capitate hairs, the third with one or two on the inner side. Cornicles long and thin, almost transparent, with faint incrassation; projecting some distance beyond the cauda. Cauda pallid green, with two pairs of lateral hairs and a median apical one. Legs pallid green, almost transparent; tarsi slightly dusky; femora and tibiæ with capitate hairs. Eyes blackish.

Length, 1–1·5 mm.

Winged Viviparous Female.—Head dark brown; antennæ dark brown. Prothorax pale yellowish green; mesothorax with dark brown median area. Abdomen pale yellowish green, with a dusky patch on the apical half, and a few small dusky spots on the basal segments and dusky lateral spots. Legs pale yellowish green, apices of femora and tibiæ dusky, tarsi dark. Cornicles pale yellowish green. Wings with smoky black veins and smoky black stigma. Capitate hairs scantier than in the apterous form, four on the front of the head, some on the two basal antennal segments, and short ones on the body, the heads being only slightly swollen. Third antennal segment with 32–36 sensoria disposed all along it, fourth with 5–8 sensoria; third segment about as long as the fourth and fifth; sixth a little longer than the fourth and fifth; cornicles showing faint incrassation, not projecting beyond the pale green cauda, which has two pairs of lateral hairs and one median apical one. A marked papilla on the under wings with five curved apical bristles.

Length of body, 2–2·5 mm.; of wings, expanse, 4 mm.

Food-plant.—Cultivated strawberries.

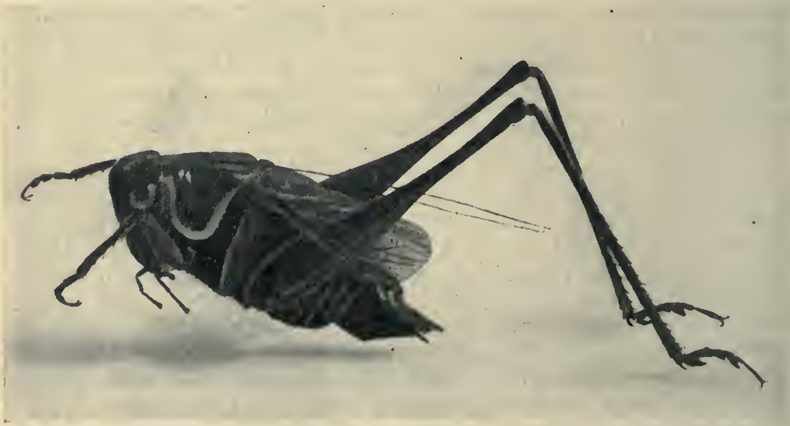
Habitat.—Hounslow, Middlesex, and Rudgwick, Sussex.

Observations.—Described from a colony sent me by the Board of Agriculture in March. At first the apterous females only occurred under the leaves; later they and the nymphs swarmed up the leaf-stalks as well. Pupæ occurred on March 29th, many on April 4th, and winged females commenced to appear on April 10th. The apterous females resemble *Myzus ribis*, but the alate forms are very distinct, having green cornicles and different abdominal ornamentation. Some of the alate females appear to have five, some three, curved bristles on the papilla on the under wings. I also found it swarming on hothouse strawberries in May at Rudgwick and doing much damage. A succession of winged broods kept on appearing until mid-June.

METRIOPTERA ROESELII.

By W. J. Lucas, B.A., F.E.S.

Yet another record of this somewhat elusive grasshopper has come to hand. Mr. W. West, of Lewisham, Curator of the South London Entomological Society's Collections, when working for Coleoptera and Homoptera, makes a point of not neglecting "other fish that come to his net." Consequently he has more than once been able to help those who work at the Orthoptera. They have now to thank him for adding another locality to the two or three that we already possessed for *M. roeselii*.



W. J. Lucas, photo.

M. roeselii (× 3).

On September 3rd, 1911, he took five specimens, three males and two females, in a reed-patch on the bank of the Thames, a few miles below Gravesend. They were not recognised at the moment, but Burr's description enabled Mr. West to identify them. Two pairs are placed in Mr. West's collection, and the odd specimen he has been kind enough to add to mine. All five were exhibited at a recent meeting of the South London Society. As August and September are the best months for the species, a magnified figure of the male accompanies this record, as well as a table for the purpose of naked-eye recognition in the field, since the species may easily be confused at first sight with the far commoner *M. brachyptera.* A third much larger species, *M. albopunctata* (= *grisea*), occurs in damp spots on cliff sides, but it is not likely to be mistaken for either of the other two.

M. brachyptera.	*M. roeselii.*
1. Size slightly smaller.	1. Size slightly larger.
2. Colour dark, usually marked with green.	2. Colour somewhat ruddy, without green markings.
3. Pronotum — flat dorsal part rather narrower.	3. Pronotum — flat dorsal part rather broader.
4. Pronotum—posterior margin of lateral flap pale.	4. Pronotum — total margin of lateral flap pale.
5. Elytra pointed.	5. Elytra rounded or even truncate.
6. ♀ Ovipositor long, scarcely angled at base, upper edge of blade curved.	6. ♀ Ovipositor about two-thirds that of *M. brachyptera*, with a sharp bend at base, upper edge of blade more nearly straight.
7. ♂ Cerci less prominent, tooth near middle of inner edge.	7. ♂ Cerci more prominent, tooth nearer tip of inner edge.

The male figured was taken on the Essex coast by Mr. B. S. Harwood, September 3rd, 1903.

Kingston-on-Thames: July, 1912.

DESCRIPTION OF THE EGG OF *VANESSA POLYCHLOROS.*

By F. W. Frohawk, M.B.O.U., F.E.S.

Apparently there is no reliable description of the colouring of the egg of *Vanessa polychloros* published, and respecting all the works on British butterflies I have referred to very little is to be found, and that is unreliable. Tutt says ('British Butterflies,' p. 341) :—"The fiction derived from a figure by Sepp, published nearly one hundred and forty years ago, that the eggs of this species and that of *V. urticæ* are very dissimilar is to be found in almost every text-book on butterflies that has been published in this country. They are, on the contrary, very similar." Barrett gives no description of the egg. Mr. South ('British Butterflies,' p. 66) describes the only eggs he obtained as "purplish with whitish ribs, but no caterpillars hatched from them. Hellins, who squeezed a few eggs from a freshly killed female, states that the colour is apparently a dull green."

Having obtained two batches of eggs of *V. polychloros* from specimens captured on April 6th last by the Hon. N. Charles Rothschild and Mr. C. Granville Clutterbuck, I am indebted to both these gentlemen for kindly sending the butterflies direct to me; thereby I have been enabled to note the colouring of the egg from the time of deposition to that of hatching.

One of the three females received I sent to Mr. L. W. Newman on April 13th, which deposited a large batch of eggs (about two hundred and twelve) during a gleam of sunshine the following morning; these he at once kindly sent to me, which arrived on the 15th. These I figured when twenty-four hours old; they were then of an apricot-buff colour. These I returned to Mr. Newman, who tells me they hatched on May 6th, remaining in the egg-state twenty-two days.

The second female died on April 23rd without depositing. Upon dissection I found her full of eggs, apparently ready for laying; they were of a clear yellow-ochre colour, of the same hue as when first laid.

The third female, which I kept under constant observation, and fed her about every other day, laid a batch of about one hundred and twenty eggs on sallow between 1 p.m. and 2.30 p.m. on April 20th. These eggs began hatching on May 7th, remaining eighteen days in the egg-state. When first laid (directly after) the colour is a pure yellow-ochre, which changes to apricot-yellow when twenty-four hours old. They very gradually assume a slightly duller colour by the third day, and by the fifth day are dull ochreous-buff. Very gradually the colour increases in depth to amber-brown when a week old; the white keels give the entire batch a drab appearance to the naked eye. Under microscopic power the ground colour is amber, checkered with underlying chestnut-red markings caused by the maturing of the larva.

After remaining for a few days the basal half assumes a more ochreous hue, while the apical half turns duller, and finally the ground colour becomes pale ochreous, the dark hairs of the larva showing through the transparent shell, and the black head covers the greater part of the crown; this, combined with the white keels, gives the eggs a dull purplish effect.

The egg is $\frac{1}{32}$ in. high and dome-shaped. The micropyle is flattened and very finely reticulated. There are from seven to nine longitudinal keels, which rise on the crown, where they are much elevated, but rapidly decrease in height on traversing the side, and form only a slight ridge over the basal half; they are fluted, and resemble white frosted-glass frills, but are only white on the upper half. The usual number is eight, occasionally only seven, and sometimes nine. The spaces between the keels are delicately ribbed transversely by about forty in number.

As will be seen by the above, the egg of *V. polychloros* is not green in any stage either before or after it is laid, and in this respect, and in structure also, it is not similar to that of *V. urticæ*, but agrees closely both in structure and colour with its near ally. *V. antiopa*.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief Gervase F. Mathew, R.N., F.E.S., &c.

(Continued from p. 204.)

July 31st was fine, bright, and very warm. In the evening I went to the woods and tried sugar. There was a clear sky, small moon, slight dew, and the air was calm and close. Moths were abundant, but mostly common species. *Apamea oculea* swarmed and was in great variety; others were *T. orbona*, *T. ianthina*, *N. baja*, *M. abjecta* (two), *C. affinis*, *C. trapezina*, *N. rubi* (second brood), *G. libatrix*, *A. pyramidea*, *H. nictitans* (one, a rare moth here), &c., and one *Dichelia grotiana*. *T. amataria* was flying in great numbers over *Chenopodium*, &c., in the rides. One *H. micacea*, six *H. paludis*, and two *C. matura* were captured at light.

The first day of August was fine, bright and hot until 6 p.m., when it clouded over, and there was a little rain between seven and eight. I bred *Zephyrus betulæ* (from Monk's Wood larvæ) and *Catocala nupta*. I went to the reed-beds at dusk and took sixteen *N. arundineta* and one *S. maritima*, but they were too worn for the cabinet, so were released in the morning, and I hope were able to find their way back to the reeds. *Nonagria geminipuncta* was just appearing, and I netted seven very fresh specimens; also one *Orthotælia sparganiella*, the first I have taken here. The 2nd was fine, bright, and warm, with fresh south-westerly breeze. The second brood of *Pararge megæra* was just coming out, and I saw six or seven; also a fresh and very abundant brood of *Lycæna icarus*, and noticed several fresh *Chrysophanus phlæas*, the first I have seen this year. I obtained the following from the electric lights at Parkeston:—*Cerura furcula* (one), *Porthesia similis*, *Hepialus humuli* (one, female), *Plusia gamma*, *P. chrysitis*, *Hydrœcia micacea*, *H. paludis*, *Miana literosa* (one, a scarce moth here), *Charæas graminis*, &c.

The 7th was bright and warm. Several larvæ of *Leucania favicolor* had fed up rapidly, and were now full grown, and one spinning up; the remainder were still small, evidently intending to hybernate. It is strange how scarce the Vanessids were this season, notwithstanding the long spell of hot weather, and in the lucerne fields, bright with flowers, I did not see one. There were very few hybernated *urticæ* about in the spring, and no *io*, but I had seen one or two of the latter lately indoors, as if they were looking for some dark corner wherein to hibernate, though it seemed early for that. I had not seen *Pyrameis atalanta* or *P. cardui* yet. *Lycæna icarus* were in great profusion among the lucerne.

The 10th was fine and bright in the forenoon and very hot, with a fresh north-easterly breeze, but became overcast after noon. I went to the woods in the evening for sugaring. Common species were abundant. I took or saw *Acronycta rumicis*, one (? second brood); *Apamea oculea* and *Triphæna pronuba*, abundant; *T. ianthina*, *Noctua baja*, *N. c-nigrum*, *Amphipyra pyramidea*, many of each; *Catocala nupta*, eight; *Noctua stigmatica*, three; *N. umbrosa*, one; *N. xanthographa*, one; *M. brassicæ*, three (? second brood); *Dipterygia scabriuscula*, one, fresh (? second brood); *Cidaria truncata*, one; and netted *Epione apiciaria*, one female; *Timandra amataria* was still abundant. On the 12th I visited the woods again. Moths were plentiful on the sugar; the same species as on night of 10th, with the addition of a few fresh *G. libatrix*. The weather for the past week was excessively warm. On the 9th the temperature recorded in the shade at Greenwich Observatory was 100°, the highest recorded since the Observatory was started nearly three hundred years ago!

Some ova laid by a female *T. amataria* captured early last month hatched in due course, and a few of the larvæ fed up rapidly, and on the 15th I saw that three of them had spun up on the muslin hood of the breeding-cage, and had changed to pupæ; most of the others were still small.

16th.—About ten days earlier I had caught a female *Chrysophanus phlæas*, and placed her out in the sun in a muslin-covered flower-pot with a growing plant of *Rumex acetosella*; she soon laid a number of eggs on the leaves and stems, and some of these were already hatched on the 16th, and the tiny larvæ had buried themselves in a groove they had eaten in the leaves. It was a very hot day. At dusk I went to the lanes and marshes, sugaring the posts and twigs; moths were abundant, the best being *Cerigo matura*, *T. interjecta*, *H. paludis*, and a second brood of *L. pallens* and *A. exclamationis*, these latter being remarkably small.

The 18th was fine and very hot—82° in the shade. I took a fresh specimen of *Eupithecia pumilata*; this must have been a third brood.

21st.—About a month earlier I had obtained a batch of eggs of *Acidalia dimidiata*, which hatched in a few days. The larvæ fed up rapidly on knotgrass, and the first moth emerged on the 21st. (None of these larvæ showed any disposition to hibernate; the last moth of the brood was bred on Sept. 9th.)

(To be continued.)

NOTES AND OBSERVATIONS.

Males of Bupalus piniaria attracted by a Spider.—On the afternoon of June 11th we went into the pine woods to find females of *B. piniaria*, and seeing about twenty or thirty males flying round a head of bracken, we at once expected to find a female, but instead we found the males "assembled" around a spider, belonging to the genus *Theridion* (thanks to Dr. Jordan for name). The spider soon captured a male, secured all its feet in a small web, and bit it under the thorax; I released the moth and removed the stem of bracken with the spider on it away some twenty yards; the males followed and at once surrounded the spider. Thinking a female *B. piniaria* might have been on the same stem, we transferred the spider to a fresh stem of bracken, and again removed it some twenty yards away. In a few seconds all the males had left the old stem and gone to the spider; then, after allowing it to capture one more *Bupalus*, we killed the *Theridion*. Evidently the scent was with the spider, for the male moths dispersed when it was bottled. Has any entomologist made a similar observation? The Hon. Walter Rothschild suggests that the spider had devoured a female *B. piniaria*, the scent of the same remaining. The spider itself was not so large as the moth's body, and it could only have sucked the juices, still the scent might have been retained.—J. J. Joicey and A. Noakes; The Hill, Witley, Surrey.

Lepidoptera attracted by "Honey-dew" on Larch-Shoots.—Whilst collecting in Northants amongst larches, several *M. stellatarum* were noticed about 6 p.m., apparently feeding upon some substance resembling mildew which had affected the shoots of the trees. Whatever the deposit or growth might have been, it appeared to be singularly attractive both to bees and insect life in general. Later in the evening sugar was practically a failure, but an inspection of the larches with a lamp showed them to be swarming with moths. There was nothing sweet in the taste of the affected larch shoots. [The mildew-looking substance mentioned by our correspondent was probably the woolly covering of the larch aphis (*Chermes laricis*, Hartig.).—Ed.]—G. B. Kershaw; West Wickham, Kent.

Oviposition of Nemeobius lucina.—On May 30th a female of this species, captured the day before, was placed on a growing plant of *Primula vulgaris*, and although very little sun had been showing, three eggs were deposited on the under side of a leaf some time during the forenoon. Whilst watching the butterfly, about 5 o'clock in the evening, it was noticed to add two more eggs to the batch, and this, although the sun was totally obscured, and had been for some time. As there had been so little sunshine throughout the day, it is probable that the first three eggs had been deposited under similar circumstances. Up till June 8th sixty-three eggs had been deposited by the one female, and these commenced to hatch on June 12th.—A. T. POSTANS; Portsmouth.

SCARCITY OF ARCTIA CAIA IN 1912.—I notice that on p. 187 of the 'Entomologist,' reference is made to the scarcity of *Arctia caia* larvæ this season, and fellow collectors of my acquaintance have also remarked on the same scarcity. In the locality where I usually take larvæ of *A. caia*, however, I have secured over one hundred this season, and these were picked up quite casually along a sunny lane about one hundred yards long. Of *Arctia villica* larvæ, however, I have not seen a single specimen where I usually take them every season.—A. T. POSTANS; Portsmouth.

EUPROCTIS CHRYSORRHŒA IN NORFOLK.—On July 7th last I captured, near Roughton, Norfolk, a female *Euproctis* (*Liparis*) *chrysorrhœa* drying its wings. I thought this was rather an unusual occurrence for Norfolk.—A. C. MORRIS; Leafield, Gibson's Hill, Upper Norwood, July 16th, 1912.

AGROTIS PUTA IN MAY.—Your correspondent, the Rev. C. E. Raven (*antea*, p. 208), may be interested to know that *Agrotis puta* is rather common at our electric lamp. It was first observed this year on May 2nd, rather earlier than in 1911, when it was first seen on the 15th of that month. *Tæniocampa gothica* sometimes lingers with us until quite the end of May.—F. G. WHITTLE; 7, Marine Avenue, Southend, July 6th, 1912.

PERCNOPTILOTA (CAMPTOGRAMMA) FLUVIATA IN SURREY.—I should like to record the capture of *C. fluviata* at a lamp in this village on May 13th last. It was in good condition and apparently freshly emerged.—H. FLEET, Junr.; 7, Park Road, Esher, Surrey, June 10th.

DICYCLA OO AND PALIMPSESTIS OCULARIS AT WINCHMORE HILL.—I wish to record the capture of a perfect specimen of *Dicycla oo* at sugar on July 5th about 8.15 p.m. at Winchmore Hill, N. I had only just finished sugaring and took it on almost the last tree I did, and needed no light to see it. I also took a fine specimen of *Palimpsestis ocularis* (*Cymatophora octogesima*) at sugar on June 9th in the same locality, but have not seen either species since, although I have been many times.—L. E. DUNSTER; 44, St. John's Wood Terrace, N.W., July 19th, 1912.

BUTTERFLIES, &C., AT FRESHWATER, ISLE OF WIGHT.—Numbers of *Macroglossa stellatarum* and *Pyrameis cardui* appeared in my garden on June 19th, and continued in diminishing quantity till the end of the month. *P. atalanta* was common at the same time. On July 4th I saw three specimens of *Colias edusa* in and around Freshwater, and heard of others. As early as July 12th the second brood of *Cyaniris argiolus* was on the wing. The first brood was noticed here on April 5th.—S. L. O. YOUNG, M.D.; Brooklands, Freshwater, Isle of Wight, July 19th, 1912.

DEILEPHILA GALII IN SOMERSET.—I have to report the capture of twenty-five larvæ of *D. galii*, feeding on yellow *Galium* on the sand-hills quite close to Burnham, Somerset.—H. DOIDGE; The Bank, High Street, Taunton, July 19th, 1912.

LIMENITIS SIBYLLA AND APATURA IRIS IN SURREY.—On July 9th four specimens of *Limenitis sibylla* were taken in a public wood near here; and on the same date a specimen of *Apatura iris* was captured in a private wood. Another specimen of *A. iris* was found drying its wing on the door of a private garden in this neighbourhood, on July 10th.—J. J. JOICEY; The Hill, Witley.

COLIAS EDUSA IN 1912.—Specimens were noted by members of the S. Lond. Ent. and Nat. Hist. Soc. at Otford on July 27th last. The butterfly has also been seen or captured at other places in Kent, and also in Surrey.—RICHARD SOUTH.

COLIAS EDUSA IN DORSETSHIRE.—It may be of interest to record the capture of *C. edusa* var. *helice* at Purbeck, June 24th.—LEONARD TATCHELL; Bournemouth.

COLIAS EDUSA IN GLAMORGANSHIRE.—I notice in last month's 'Entomologist' (p. 207) that Mr. Rowland-Brown records having seen this butterfly in Bucks, on May 30th. I saw a male *C. edusa* on June 22nd, about 4 p.m., on the roadside near my house at Llandaff. Very few specimens were seen last autumn in this county.—E. U. DAVID; Yscallog, Llandaff.

BUTTERFLY COLLECTING IN SICILY AND CALABRIA IN 1911.—It is pleasant to look forward in the spring to rambles in "sunny" Sicily and Calabria, and especially was this the case after the long dreary winter in England of 1910–11, but occasionally the realization does not come up to expectation. I left London in dull, cloudy weather on April 25th, and on the evening of the 27th arrived at Nervi, a lovely health resort a few miles south of Genoa, where I stopped a night. The town is sheltered from northerly and easterly breezes by hills, and the Pensions have some of the loveliest gardens I have seen, and I found the scent of the orange blossom almost overpowering. The sky was overcast, with occasional slight showers, and during a long walk up a beautiful mountain gorge the only butterfly that ventured out was *ægeria* (two specimens). Next day I reached the Junction Station of Roccasecca, between Rome and Naples, at 10 a.m., and hoped for better success, but the clouds hid the sun nearly all day, and only *rapæ*, *cardamines*, *ægeria*, and *edusa* were seen or captured, and one larva of *B. quercus* picked up. An amusing episode at the solitary restaurant (a very poor one) and the discovery of a magnificent pass, where the road follows the windings of the River Garigliana (or a tributary) through one of the grandest chasms imaginable, redeemed the day from being unprofitable—I much regretted the absence of sunshine. Next day clouds covered the sky when I reached Gioja Tauro, in Calabria, where I had planned another break in my journey, and instead of stopping I went straight through to Messina.

My first day in Messina (April 30th) proved a glorious day. My son and I took a vehicle as far up the mountain as the road would permit and revelled in the sunshine. We soon found that the season was very backward, at least three weeks later than the spring of 1910, owing to the relatively very severe winter and continued rains. Guns were popping off in all directions, a sign that the quail was migrating, so we decided to get lunch first, as this is the chief difficulty in Sicily away from the large towns. For this purpose a tin of sardines is a great help, as it forms a first course, and a little butter in which to fry some eggs is essential. With these requisites the contadina or peasant farmer's wife, who was known to us, provided eggs, bread and wine, and we made a meal. Our walk, owing to the quails, was somewhat curtailed, but my note book records:—"Sunny day, lovely gorge, butterflies galore, chiefly *cleopatra* (male and female), *cardamines* (male), *sinapis*, *ægeria*, *megæra*, and 'blues,' all fresh."—J. Platt Barrett; "Westcroft," South Road, Forest Hill, London, S.E.

(To be continued.)

SOCIETIES.

The South London Entomological and Natural History Society.—*March* 14*th*.—Mr. A. E. Tonge, President, in the chair.—Wm. Bateson, Esq., M.A., F.R.S., F.E.S., and Professor E. B. Poulton, D.Sc., M.A., F.R.S., were elected honorary members.—Mr. Andrews exhibited three species of Syrphidæ, parasitic in their larval stage upon Lepidoptera, viz., *Catabomba pyrastri*, *Xanthandrus conitus*, and *Melanostoma mellinum*.—Mr. Adkin, an extreme melanic specimen of *Noctua xanthographa*, taken in his garden at Lewisham in 1911.—Mr. Newman, living full-fed larvæ of *Melitæa aurinia* fed up in temperature of 60° to 70°, and a pair of *Saturnia carpini* with all the usual reddish markings of a clear yellow. It was bred from a yellow male and a red female.—Mr. Blenkarn, the Coleopteron *Haliplus nomax*, from Coatbridge, recently new to science.—Mr. B. H. Smith, a living larva of *Colias edusa*, from ova laid in October last; one larva had already pupated.

April 11*th*.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Step exhibited the crustacean *Squilla demarestii*, and described its Mantis-like appearance and habits.—Mr. Gibbs, long series and specimens of *Pieris napi* from various British localities, and pointed out their racial characters with reference to various continental races and forms.—Mr. Cowham, hybrid *Nyssia zonaria* and *Biston hirtaria*, varied series of *Hybernia leucophæaria* and *H. marginaria*, small forms of *Leucania pallens*, probably of the second brood, and bred specimens of *Zonosoma pendularia* from Oxshott, referable to the rosy form var. *subroseata*.—Mrs. Hemming, bred series of *Melitæa aurinia*: the Carlisle series included a melanic form and var. *virgata*, the Welsh series included forms with very red ground colour, and the Oxford series contained very pale specimens as well as a specimen closely resembling *M. cinxia*.—Mr. Quarrington, living larvæ of *Rumicia phlæas* taken wild on April 7th and 10th.—Mr. Newman, full-fed larvæ of *Abraxas grossulariata* kept in sleeves out-doors, and living pupæ of *Dryas paphia* and *M. athalia*.—

Dr. Chapman, living larvæ of *Leioptilus tephradactyla*.—Mr. Tonge, a branch of *Viburnum* from Tilgate, with four larvæ of *Ægeria andrenæformis*. — Mr. Colthrup noted the abundance of *Biston hirtaria* this season, especially around London.—Mr. R. Adkin, many examples of named varieties of British Lepidoptera to illustrate his paper entitled "Varietal Names as Applied to British Lepidoptera."

April 25*th*.—Mr. B. H. Smith, B.Sc., Vice-President, in the chair.—Mr. Dennis exhibited a stereoscope, fitted up so as to show diminution and intensification of the stereoscopic effect.—Mr. H. Moore, Lepidoptera from N. Borneo, including *Papilio paradoxus* var. *tileicles*, *Hestia hypermnestra* and var. *belina*, *Hestia lynceus*, a large species of *Nyctalemon*, &c.—Mr. Edwards, several species of the genus *Charaxes* from Central and South America, and a *Cucullia verbasci* which had been two years in pupa.—Mr. Lucas reported that from April 4th to April 23rd, in the New Forest, he had noted fifty-seven species of plants in flower, and that *Boarmia cinctaria* was out on April 5th. The rest of the evening was given up to the exhibition of lantern slides by Messrs. Dennis, Lucas, and Edwards, the last-named showing slides illustrative of the anomalous animal the *Peripatus*.—HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*February* 18*th*, 1912.—Meeting held in the Royal Institution, Colquitt Street, Liverpool.—Dr. P. F. Tinne in the chair.—Mr. William Mansbridge contributed notes on "Breeding Experiments with the Black Race of *Boarmia repandata* (var. *nigra*)," and summarized the results as follows:—In 1909 (*a*) a wild female of the local type form gave all var. *nigra*; (*b*) a wild female var. *nigra* gave all black moths; (*c*) a pairing of *nigra* male and type female gave all types. In 1910 (*a*) type × type gave 66·6 per cent. type and 33·3 per cent. var. *nigra*; (*b*) *nigra* × *nigra* gave 92 per cent. *nigra* and 8 per cent. type; and (*c*) *nigra* × *nigra* gave 96 per cent. *nigra* and 4 per cent. type; while in 1911 (*a*) type × type gave all type; (*b*) *nigra* male × type female gave all *nigra*; (*c*) *nigra* × *nigra* gave 95·7 per cent. *nigra* and 4·3 per cent. type, and (*d*) a second experiment of the same gave 70·5 per cent. *nigra* and 29·5 per cent. type. In 1910 moths from the broods *a* and *c* were used for the cross pairings of type and variety, the others being inbred; and in 1911 all were inbred. Dr. Tinne exhibited *Lycæna icarus* from North Ireland, including very blue females.—WM. MANSBRIDGE, OSCAR WHITTAKER, *Hon. Secretaries.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—*February* 7*th*.—Mr. J. Mangan, M.A., gave a lecture on "The Larch Sawfly (*Nematus erichsonii*) and its Parasites." After dealing with its life-history, habits, and destructive powers, he detailed the various natural checks found to affect this insect:—(1) Parasites. *Mesoleius aulicus* has been found (in the Lake District) in the greatest numbers, and is apparently the most valuable natural check. *Microcryptus labralis* also occurs; examples of each were shown. (2) A fungus attacks the sawfly cocoons. (3) The field-vole (*M. agrestis*) occasionally destroys as many as thirty or forty per cent. (4) Birds, such as chaffinches, tits, and starlings, are useful.—Mr.

B. H. Crabtree read a paper:—"Some Butterflies of the Rhône Valley." During July, 1912, he visited Chamonix, Zermatt, and Berisal, and took between fifty and sixty species, specimens of most of which were exhibited. The species of the genera *Lycæna*, *Colias*, *Parnassius*, *Erebia*, &c., were particularly noteworthy.—Mr. J. H. Watson exhibited *Ornithoptera priamus* (male and female) and *O. paradisea*, and an example of *O. d'urvilleana*. He also showed *Papilio laglaizei* and a moth which mimics it in a most remarkable manner—*Alcides agathyrsus*.—Mr. W. Mansbridge showed *Tortrix costana* with var. *latiorana*, from the Liverpool district, and var. nov. *liverana*, taken by himself at Liverpool, and by Mr. A. E. Wright at Burnley. He showed also *Amphidasys betularia*, from Simonswood, Lancashire, an intermediate form between the type and var. *doubledayaria*.—Mr. R. Tait, Jr., recorded the capture, by Mr. W. A. Tyerman, of *Dasypolia templi*, in Oldham Road, Manchester, on February 5th, 1912.—A. W. Boyd, M.A., *Hon. Secretary*.

RECENT LITERATURE.

Forty-second Annual Report of the Entomological Society of Ontario, 1911. (Published by Ontario Department of Agriculture, 1912.)

This report, consisting of one hundred and fourteen pages with a number of illustrations, relates chiefly to useful and injurious insects. One or two short papers are of a more general nature, including one on "Insect Migration at Aweme, Manitoba." A discussion on the "Catalogue of Canadian Insects," to be at once undertaken, will be found of interest.

W. J. L.

The Early Stages of our Dragonflies.* By W. J. Lucas, B.A., F.E.S.

We have now received a print of the very interesting address which Mr. Lucas presented to the Lancashire and Cheshire Entomological Society at their last Annual Meeting. A brief summary of the address was embodied in the account of that meeting which appeared in the 'Entomologist' for February last, but we find that Mr. Lucas was there wrongly reported to have drawn "particular attention to the habit *Ischnura elegans* possesses of descending beneath the surface of the water" for the purpose of oviposition. The species really referred to was, of course, *Enallagma cyathigerum*, and on one or two occasions we have ourselves witnessed the same insect engaged in subaqueous oviposition.

Mr. Lucas traces in some detail the progress of our knowledge of dragonfly nymphs, but he seems to regard Moufet's 'Insectorum Theatrum' (1634) as containing the earliest reference to them. According to some other bibliographies which we have seen, however, the literature of the subject begins with the writings of Rondelet (1555) and Aldrovand (1618). At the present time, Mr. Lucas says, "leaving out *Sympetrum vulgatum*, *S. fonscolombii*, and

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* Thirty-fifth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society. Session 1911.

S. flaveolum, the only species of which descriptions appear to be wanting are *Sympetrum sanguineum*, *Libellula fulva*, *Somatochlora arctica*, *Æschna cærulea*, *Lestes dryas*, *Agrion armatum*, and *A. hastulatum*." As a matter of fact, some of these nymphs are well known already. For instance, *Sympetrum sanguineum* and *Libellula fulva* have been fully described by Dr. E. Rousseau, the first in Ann. Soc. Ent. Belg. lii. p. 290 (1908), and the second in Ann. Biol. Lacustre, iii. p. 337 (1909); Dr. F. Ris described the nymph of *Somatochlora arctica* in Mitt. Schweiz. Ent. Ges. xii. p. 33 (1911). Apart from Hagen, a short diagnosis of *Lestes nympha* (= *L. dryas*) may be found in Tümpel, Geradfl. Mitteleuropas, p. 72 (1901). Reference may also be made to the tables of nymphs given by Ris (in Brauer, Süsswf. Deutschl. Odon. (1909)), in which are characterized the nymphs of several species occurring in our own country.

British Odonatists are much indebted to Mr. Lucas for the beautiful figures of dragonfly nymphs which he has published already, and we learn with satisfaction that he has before him the nymph-skins of sixteen additional species, from many of which he hopes to make drawings.

H. C.

OBITUARY.

Edward Arthur Fitch.

Edward Arthur Fitch died at the Brick House at Maldon, after an operation for acute gastritis and other complications, early on June 28th last. He was a J.P. and C.A. for Essex, and had several times been Mayor of his town, besides filling many other civil offices. In general, it is said, "Mr. Fitch was remarkable inasmuch as, while taking an active part in local and public affairs, he yet found time to devote attention to archæological and literary matters, and display an interest in sport, while all the time he was carrying on business as a farmer." As an entomologist he was one of our great disappointments. An education at Great Ealing School and King's College, London, did little more than harness natural brilliancy and that quick perception of fundamental points in an intricate subject, so well exhibited in his generic articles concerning our parasitic Hymenoptera, upon which he wrote the text and Bridgman the tables of species in their incomplete "Introductory Papers on Ichneumonidæ," published in our Magazine from February, 1880, to August, 1885. This is the work by which he will be remembered among us; though his "Descriptions of Oak-galls," translated from Mayr's 'Die Mitteleuropaischen Eichengallen' by Mrs. Hubert Herkomer and himself, together with many shorter articles from his pen upon a wide range of kindred subjects, also appeared in the same Magazine, of which he became an Assistant Editor in 1877. He joined the Entomological Society of London when only twenty years of age, served it as Hon. Sec. in 1881–5, and as Councillor in 1879 and 1886, about which time he threw up Entomology finally and entirely. We have corresponded with him from time to time, and ever found him most courteous and willing to lend rare tracts on the Palæarctic Parasitic Hymenoptera, upon the literature of which he possessed something very like a complete collection in 1890. As a general naturalist he was known as Chairman of the Essex and Kent Sea Fisheries, a Fellow of the Linnean Society, of the Essex Archæological Society and Field Club, of which last he was President for ten years. He was the only son of Mr. Edward Fitch, of London, and was born on February 23rd, 1854. He married a daughter of the late Mr. Isaac Belsham, of Rayleigh, and leaves five sons and four daughters.—C. M.

Robert Shelford, M.A., F.E.S.

The tragic and premature death of Robert Shelford has removed a most active and competent entomologist in the prime of his career, before the completion of his work.

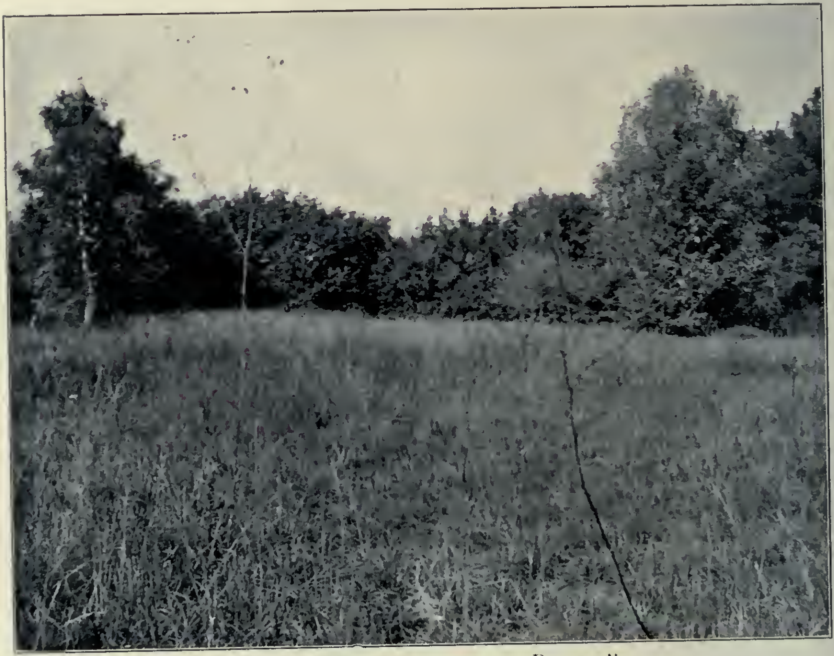
He was born on August 3rd, 1872, at Singapore, and so was within a few weeks of completing his fortieth year.

Educated at first privately, and then at King's College, London, he proceeded to Emmanuel College, Cambridge, where he passed second in Science. His first appointment was at Leeds, as Teacher in Physiology, but this he soon gave up in favour of an offer more tempting to a man of his temperament, the Curatorship of the Museum at Kuching, Sarawak, under Rajah Brooke. After serving here seven years he returned to England to take up an appointment in the Hope Department of the University Museum of Zoology at Oxford, where he devoted himself with enthusiasm to the task of arranging the rich collection of Orthoptera, with the result that before long he found himself involved in the entire reorganization of the Blattidæ; he rapidly acquired an unrivalled knowledge of this group, examined a very large number of types from most of the museums in the world, and published a valuable and important series of papers, in various periodicals, dealing with his speciality. Had he been spared a few more years, he would have doubtless given us an entire monograph of the recent cockroaches.

His general scientific education, and his seven years in the gorgeous tropics of Sarawak, gave him a breadth of outlook upon scientific problems which he expressed in terse and crisp language. In addition to his special work he published articles on Bornean Anthropology and Folk-lore, and upon Mimicry in Bornean Insects, and he whiled away some of the tedium of his last years, spent in almost constant suffering, by writing a book upon his observations of tropical nature in Sarawak. He left the MS. unfinished, but it is to be hoped that part at least will yet see the light.

About three years ago, the complaint which had already severely handicapped him assumed an aggravated form, and under medical advice he moved to Margate, where he lingered on, reclining constantly on his back, obliged to abandon all hope of future activity. He bore the cruel disappointment with great fortitude, till his sufferings, becoming more and more acute and practically incessant, drove him to desperation.

Thus Entomology has lost a devoted servant, who had already achieved distinction, and cut off in the prime a most promising scientific career.—M. B.



Puszta Peszér. A typical "Buczka."

Puszta Peszér. A typical flat open space.

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SOME NOTES ON THE LIFE-HISTORY OF *MELANARGIA JAPYGIA* SUBSP. *SUWAROVIUS.*

By F. W. Frohawk, M.B.O.U., F.E.S., and the Hon. N. Charles Rothschild, M.A., F.L.S., F.E.S.

(Plate VII.)

This Eastern race of *M. japygia* extends as far westward as Puszta Peszér in Hungary. This is apparently the only locality in that country where the species is at present found, though, according to Aigner,* at one period it occurred close to Budapest. Aigner * further maintained that the Hungarian specimens could be distinguished from those coming from the Ural Mountains and South Russia, and formed a special local race, *clotho* Hb. This distinction, however, cannot be maintained, and the most that can be said is that the Peszér examples are very large and very white: they are, in fact, remarkably fine specimens, a feature exhibited by most of the butterflies occurring in this classic locality. Several entomologists have described Peszér, but only one appears to have seen this remarkable butterfly in any abundance, *i. e.*, Miss Margaret E. Fountaine,† and none have, as far as we are aware, described the peculiar features of the wood. Puszta Peszér is a long narrow wood of some 1300 acres of by no means a uniform character. The northern third has been artificially afforested some eighty years ago, and consists largely of acacia (*Robinia pseudacacia*) and poplar trees, planted on sandhills which at the time of afforestation were wind-blown and shifting. The middle third of the wood consists (or perhaps one should say consisted) largely of oak trees, sparsely scattered with numerous open spaces between them, the soil being a mixture of sand and humus, or, as it is locally known, "black sand." The most southern portion of the wood resembles the middle portion as to general contour and quality of the soil, but lacks, to a great extent, the oak which is here replaced by birch. It is in the two last-named portions of the wood (the true forest) where *suwarovius* is found, and both these portions possess a common geological feature, namely, that of "Buczkas" or sandhills (see Plate VII). The whole surface of the ground is covered with mounds of soil (a mixture of sand and humus) shaped like an inverted saucer, *i. e.*, rounded at the top (which is nearly pure sand) and gradually sloping away to a wide flat base of the above-mentioned "black sand." The effect of this formation is that the surface of the land really consists of a number of mounds with more or less flat spaces between them, the mounds being more sandy than the plains between. The rain water falling on the mounds rapidly runs down from them, but remains on the flat land between, and produces a curious effect on the general vegetation of the locality. The mounds possess but few plants, those present binding together the sand, but the flatter spaces between (see Plate VII.) being richly watered are covered with numerous flowers and plants; in fact, in some cases where the land is especially low-lying, the ground is positively swampy and supports reeds. The imagines of this butterfly flutter about over these sandhills, where they deposit their eggs during June, and the species would appear to be normally full out about the middle of the month. The insects, however, generally frequent the flowers growing on the flatter portions, where they obtain sustenance. Miss Charlotte de Wertheimstein informs us that she has absolutely observed a female deposit an egg on a plant of *Festuca sulcata.* Owing to the fact that some of the grasses grow so very close together, it is a matter of extreme difficulty to decide from which of several grass plants the larvæ taken at night with a lantern really come. The adult larvæ which are described in this paper were undoubtedly taken from a plant of *Festuca sulcata* growing in the "Buczkas," *i. e.*, the raised sandhills, and this *Festuca*, with its variety *rupicola*, we have no hesitation in stating is the food-plant, at all events here, of the larva of this butterfly. The other species of grass growing in close proximity (and there are several) can now be rejected as possible food-plants with absolute certainty.

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* Rov. Lap. xiv., p. 144 (1907).

† Ent. xxxi., p. 286 (1898).

In June, 1910, we placed a much worn female of this species on a pot of grass, and about thirty ova were laid and dropped loosely on the surface of the soil. These ova hatched on July 19th, and in February, 1911, we found that two had recently fed on fescue grass (*Festuca ovina*). They had grown slightly, and had become greener in colour, but they died shortly after. As we shall show later on in this paper, it is quite abnormal for the eggs of this species to be dropped in the grass.* A similar experiment was carried out in 1911, and eggs were obtained all glued to the gauze, or the wires supporting the gauze, or the grass. On June 10th this year some females were placed on different species of grass plants potted up, each with a gauze-covering supported with wires. The butterflies at once began depositing, they lived for three weeks in captivity, the last one surviving until July 5th; they all deposited a number of eggs. All the eggs were laid either on the grass blades, gauze-coverings, or the wires, but by far the greater number were laid on the gauze, often in rows or clusters between any folds they could find for the purpose, or between the wire and gauze when the eggs were usually deposited on the wire. A large number of eggs were laid while the females were under observation, so that the exact method of depositing could be accurately recorded. Unlike *M. galathea* which deposits its eggs at random, letting them fall among the grass, without laying them on any object, *suwarovius* always attaches its egg in a manner similar to that of other Satyridæ.

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* This phenomenon has been observed in the eggs of other lepidopterous insects when they are in a worn and emaciated condition, for example, in the eggs of *Sphinx ligustri*, both the authors and Mr. L. W. Newman having possessed worn females of this moth which deposited eggs entirely lacking the usual gummy substance by which they are normally fixed to the leaves of the food-plant.

The egg is $\frac{1}{24}$ in. high, of an ovate-spheroid shape, broadest below the middle; the micropyle is finely pitted, the entire surface finely granular; the apical third and basal third irregularly and roughly reticulated, forming ridges and coarse granulations which develop into short striations longitudinally, the central third is strongly and boldly fluted with from ten to thirteen longitudinal keels—of ten eggs counted. Two had ten, two twelve, one thirteen, and five eleven. The concave intervening spaces are finely ribbed transversely, and at each end of the concavities are very short ribs between the main keels.

The colour when first laid is greenish white, which gradually becomes whiter, and finally it is white with pale citrine-yellow shadows, giving the egg a very pale lemon-yellow tinge. From the density of the shell it remains unchanged in colour until hatched, when the empty shell is pure white.

The egg state lasts about twenty-three days. The eggs deposited in 1911 started hatching during the first week of July.

The young larva eats away the whole of the crown of the egg, emerges, and rests close to the empty shell, remaining motionless without feeding throughout the autumn and early winter. All those in our possession during 1911–1912 died during hibernation; the last one survived until the middle of March, 1912, living eight months without moving after it first emerged from the egg. The continued damp weather of last winter obviously was the cause of failure, as all were attacked by mould.

The larva directly after emergence measures $\frac{1}{10}$ in. long, the head is large creamy-ochreous in colour, the surface roughly granular, and beset with white hairs rising from tubular bases; eye spots and mouth parts brown; the body tapers to the anal segment which bears two terminal points each ending in a fine straight hair; the segments are somewhat indistinctly subdivided, the first division occupies the anterior half of the segment, on which are placed (on each side) four long curved glassy white hairs with tubular bases; the first is sub-dorsal, the second super-spiracular, and the third and fourth subspiracular on the large lateral lobe; all curve backwards except the super-spiracular one, which curves forwards; on the posterior half is a second sub-dorsal hair, acutely elbowed where it is widened out, then running at right angles and sharply pointed; other hairs exist on the ventral surface and claspers. All the hairs are pure white and glassy. There is a fine medio-dorsal longitudinal line, a finer and less distinct sub-dorsal line, and a rather plainer spiracular line; between these two lines is a rather broad band; this as well as the lines are dull red-brown; the spiracles are dark brown. The whole surface of the body is granular and of a pale creamy-ochreous colour.

On May 17th, 1912, we received from Hungary two larvæ, one almost fully grown, the other rather smaller; from their great similarity to the larva of *galathea*, we at once felt certain that they were *suwarovius*, which is now proved to be the case by the emergence of the perfect insect. The larva when fully grown is $1\frac{5}{16}$ in. long. Excepting its larger size and the formation of the head it is exactly like *galathea* in form, and in colour it greatly resembles the green variety of the latter. The chief difference is the head of *suwarovius*, which is wholly green and unicolorous with the body, and bears two flattened projecting points with the front edge serrated. The head of *galathea* is globular, without the points, and always ochreous-yellow both in the green and ochreous forms. *Suwarovius* has deep orange spiracles which in *galathea* are black.

The ground colour of *suwarovius* is green, with a dark green medio-dorsal longitudinal stripe bordered on either side by a pale yellow-green line; a greenish white subdorsal stripe bordered below by dull green; spiracles deep orange; legs pale buff; anal points purple at base, fading into rose pink at tips and laterally striped with pearl white. The entire surface, including the head, is clothed with white sharply-pointed bristles.

On May 26th the largest larva ceased feeding and roamed about for several hours, and the following day entered the basal grass stems and spun a loose network of silk on the surface of the earth and stems, forming a slight oval-shaped cocoon, in which it remained concealed almost hidden from view for a week, and pupated on June 3rd. The following day it was figured as it was, but in order to show the cocoon more clearly some of the grass (*Festuca*) was removed from the front; after figuring it, the top of the cocoon was opened up for examination of the pupa, when it was then of a translucent pale ochreous-green over the head, thorax, and wings, inclining to glaucous on the anterior portion; and the abdomen pale amber. The colouring very gradually became duller and uniformly more ochreous-olive over the head, thorax, and wings, and the abdomen browner. By the fourteenth day the central area of the wing assumes a pale buffish tint, the base and hind margin remaining greenish, and a few indistinct smoky-brown spots appear between the nervures; by very slow degrees the green colouring disappears and the wings become opaque-ochreous, and very gradually the head and limbs acquire a dusky hue, and the abdomen deepens slightly. On July 6th the colouring of imago began to appear, on the following day it rapidly matured, the wings then showing ochreous-yellow marked with dark brown, the rest of the pupa being dull brown, and on July 8th a fine female butterfly emerged. The pupal stage lasted for thirty-five days.

The pupa measures $\frac{7}{10}$ in. long. It closely resembles that of *galathea*, but is considerably larger, being $\frac{1}{7}$ in. longer, having the abdomen more elongated, with a dorsal depression between the second and third segments, and the cremaster is more decurved, which in *galathea* is almost straight; the ventral outline of *suwarovius* is straight from the apex of the wings to the cremaster, otherwise the form is very similar to *galathea*. The cremastral process terminates with a bunch of amber-coloured spines, some almost straight, others having the apices slightly curved. The abdomen is clothed with minute dart-shaped spines and the entire surface is granular. The thoracic spiracle, like *galathea*, forms a conspicuous black projecting ear-shaped process, giving the head a peculiar appearance. The wings are finely transversely reticulated and the whole structural detail is finely outlined with brown.

The authors take this opportunity of expressing their most sincere thanks to Mr. Theodor Micklitz, the Director of the Austrian Emperor's Forests, for his great kindness in granting permission to visit Puszta Peszér, without which this present article could not have been written.

THERA VARIATA IN BRITAIN.

By Louis B. Prout, F.E.S.

Probably the above heading will cause surprise to a good many readers, and some may wonder whether my next discovery will be *Camptogramma bilineata* in Britain! It seems to have been forgotten by, or to have remained unknown to, the majority of present-day British lepidopterists, although it was well known to the illustrious Doubleday, that the *Thera* which occurs so generally and so abundantly in our pine-woods is not the true *variata*, Schiff., but an allied form (whether species, subspecies, or fixed variety is not yet positively determined) appearing in Staudinger's 'Catalog' as "v. (et ab.) *obeliscata*, Hb." In the 'Entomologist,' vol. iii. p. 84, Doubleday wrote: "*Thera obeliscata* of Hübner.—I send you two larvæ of our *Thera*, which I think is really distinct from the *variata* of Hübner,* although I believe all modern entomologists are of the contrary opinion: Dr. Staudinger has sent me what he considers intermediate varieties, but they do not seem so to me: the true *variata* is of an olive or greenish brown, with a strongly dentated central fascia; ours is always either of a rufous or blackish tint, and the central fascia is scarcely at all dentated." Newman, in describing the larva (*tom. cit.*, p. 83), assents to Doubleday's opinion, and in 'British Moths' (p. 151) follows the same course, maintaining the name of *obeliscata*.

Staudinger (Stett. Ent. Zeit. xxii. 389, 1861) only tells us that he sinks *obeliscata* as var. to *variata* because the identity "is said to be experimentally proved" and has been "confirmed to him by his friend Wocke"; a highly unsatisfactory note, for which I can find no experimental basis, and doubly unsatisfactory because Staudinger in the self-same place speaks of the two as "so different in appearance," and records *only* the *obeliscata* form for Bossekop. On the other side we have (apart from the *ipse dixit* of Treitschke) to consider the following observations. Ratzeburg ('Waldverderbniss,' ii. 407, 1868) says that several recent observers, as Herrn Tieffenbach and Werneburg (*in litt.*), agree that the *obeliscata* form lives on Scotch fir, the *variata* form on spruce. Rössler (J. B. Nass. Ver. Nat. xxxiii.–xxxiv. 154) has the same experience (*variata* on *Pinus abies*, *obeliscata* on *Pinus sylvestris*), and a like observation is quoted by Kolbe (Einführung Kenntn. Ins. p. 67), but probably at second- (or third-) hand, as he attributes it to "Staudinger." Klemensiewicz (Verh. z.–b. Ges. Wien, xliv. 188) confirms Rössler with the statement that in Brody, where the woods are exclusively of *Pinus sylvestris*, he has always found only *obeliscata*, whereas his general experience with regard to Galicia is that *variata* is much the commoner and more widely distributed. Again, Franz Schmidt (Arch. Ver. Fr. Nat. Mecklenburg, xxxiii. 186, 1879) questions whether Staudinger has done right in uniting them, and records that *obeliscata* is very common in all his pine-woods twice in the year, but that *variata* is scarce and local, and has never occurred among *obeliscata*. And in 1888 A. Hoffmann (Stett. Ent. Zeit. xlix. 172) reports *variata* as occurring in the Upper Hartz Mountains in great numbers from the end of June to the end of August, apparently in a continuous succession, very variable, but always belonging to "typical *variata*," the larva on *Pinus picea*. Recently the question has again been somewhat to the fore, *e.g.*, Laplace (Mitt. Ent. Ver. Hamburg–Altona, 1899–1904, p. 100) records *variata* "everywhere in spruce-woods, probably two broods, middle of May to end of July, larva May and June on spruce; *obeliscata* everywhere in pine- (Kiefern-) woods, irregular, but certainly double-brooded, end of May to October, larva May and July–August on pine (Scotch fir)." Blöcker (Rev. Russ. Ent. viii. 48) writes in a similar strain, that *obeliscata* is "unconditionally an independent species. Besides the extraordinarily sharp distinction in design and ornamentation, the two forms are distinguished in manner of life: *variata* lives on spruce, but *obeliscata* on pine, and appears a little later than *variata*. In pine-woods only *obeliscata* is taken; in spruce-woods only *variata*. Where both spruce and pine grow together, both species occur together, but evidently they do not mix, as intermediate forms are not met with."

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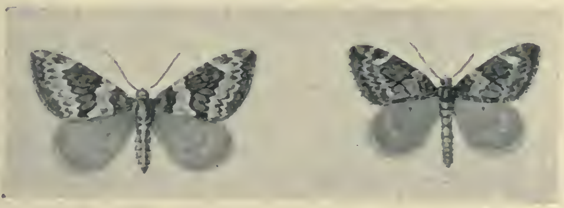
* *Variata* [Schiff.] Schmett. Wien. p. 110; Hb. fig. 293; Tr. vi (1), p. 334 (*nec* Haworth).—L. B. P.



♀ *Thera variata.* ♂

The above survey, which of course does not profess to be exhaustive, will show that we have been much too "previous" in merging the whole heterogeneity under the single name of *variata*, and have now to submit to a third edition of the inconvenience to which we were subjected nineteen years ago, when the late C. G. Barrett announced the "true *Acidalia osseata*" in Britain, and again, four years ago, when Messrs. Sharp and Wightman introduced us to "*Nonagria neurica* in Britain." When will entomologists learn the importance of maintaining a separate name for a separate concept? Whether *obeliscata* be or be not a "species," it is an entity which we ought never to have allowed ourselves to call "*variata*"; if we were very anxious to bolster up the Staudingerian theory, it would, of course, have been permissible, though rather cumbersome, to call our insect "*variata obeliscata*."

For myself, I have always felt convinced that the two were species, and I submitted the genitalia to Mr. Pierce several years ago; but as these unfortunately yielded nothing tangible, I published nothing on the subject, unless possibly there be a stray note in the Trans. City Lond. Ent. Soc., in connection with an exhibit. At any rate, it was with no small degree of pleasure that I received from my friend Major Robertson, in December last, six bred specimens of the true *variata*, which emerged in May, 1911, from larvæ taken on small ornamental spruce in his own neighbourhood (Chandlers Ford). They had struck him as a peculiar form, quite different from anything which he had seen before, nor were they familiar to any of his friends who had seen them; but not being acquainted with the particulars which I have set forth above, he was naturally unprepared for my identification. I promised him at the time that I would publish a note on the discovery, but asked leave to postpone it for a little, expecting shortly to be working at the genus in preparation for Seitz's 'Macro-Lepidoptera of the World.'

In the meantime Major Robertson has been successful in breeding it again, so that it is evidently now established, however it may have been introduced. He has recently presented to the British Museum a very nice series (mostly males, but including two females) bred in the middle of May; these I have had the pleasure of examining. They vary moderately, but never in such wise that they could be mistaken for *obeliscata*. Indeed, I may mention, as illustrating to those readers who have not yet seen them the wideness of the divergence, that Mr. J. Hartley Durrant (in the neighbourhood of whose Thetford home *obeliscata* used absolutely to swarm) did not at all recognize them, and assured me he had never seen a specimen approaching them. The width and strength of the median band varies a good deal, the tone of colour slightly, some being greyer, some browner; but none approach the red-brown of *obeliscata*, nor the melanism of its ab. *obliterata*. The interesting ab. *stragulata* Hb. (= *vitiosata*, Frr. = *resinaria*, Peyer.) has not yet occurred among Major Robertson's forms.

In addition to the colour difference, which alone is used in Staudinger's 'Catalog' (*variata* = "forma grisescens," *obeliscata* = "forma brunnea vel fulva"), and the jagged median band mentioned by Doubleday (see above)—both good characters—true *variata* can nearly always be differentiated at a glance by its better-marked and strongly dentate subterminal line (often very clear and pale) and better-marked hind wing, nearly always with a distinct central spot and not rarely with a fairly definite postmedian line. It is only in a few very weakly marked specimens that these characters can become obliterated; I believe that wherever the course of the pale postmedian line of the fore wing can be seen at all in either species, it will be found absolutely reliable.

It will be interesting to see, now that Major Robertson's discovery has called attention to the matter, to what extent *variata* really is established in Britain, and how far it maintains the distinctions of habitat and food-plant claimed for it on the Continent. In our early literature, the only hint with which I am acquainted is a note by Sir Thomas Moncreiffe in 'The Scottish Naturalist,' vol. iv., p. 241: "We have a dark and a pale variety here, which Mr. Herd believes to be different insects. He tells me the larvæ are quite distinct, and that from one form he always breeds the dark insect, and from the other the paler." But as darkness and paleness are not the obvious distinctions of the two species before us, and no mention is made of different food-plants (the record is simply "common among Scots fir"), not much use can be made of the note. I am, however, able to add to Major Robertson's two other records. Dr. E. A. Cockayne has detected in his collection a single female of *T. variata* which he took on June 10th, 1901, on a spruce in a wood of oak and spruce in Berkshire. He spent an hour in the same locality this year without seeing either *variata* or *obeliscata*. The Rev. C. E. Raven, of Cambridge, has had a very interesting experience. The week after Easter he was beating spruce in the New Forest for larvæ of *Boarmia ribeata* (*abietaria*), and beat among them a large number of what he assumed to be *obeliscata;* of these he kept some twenty-five to thirty to renew his series. They commenced to emerge by the end of April, the first being a beautiful female aberration of *variata*, bronze-coloured, with no bar, and of a very marbled appearance, and washed with green in certain lights. Then came a typical grey female *variata*, but after this, with the exception of one male *variata* and one female which Mr. Raven regards as "as nearly as possible intermediate," all (some fifteen) were typical *obeliscata*. Mr. Raven has kindly invited me to study his material closely, as soon as an opportunity offers, and in the unlikely event of my judgment differing from his, I will report to readers of the 'Entomologist' later. Neither he nor Major Robertson has as yet detected any distinction in the larvæ, but the latter has kindly promised to send me some, in the hope that I may be more fortunate.

With the exception of Mr. Raven's, I have no record of *obeliscata* feeding on spruce. The testimony, both British and foreign, is unanimous to the fact that its natural food-plant is Scotch fir, and as this is our only indigenous British pine, the dominance of *obeliscata* in this country is not surprising; but there must have been hundreds of opportunities, ancient and modern, for the introduction of *variata* (which has *never* yet been recorded on *Pinus sylvestris*) with other species of pine (*sens. lat.*), and it is quite possible—though I have hazarded a *conjecture* of recent importation—that it has been sedentary among us for a very long period. The question of food-plant, moreover, though important, must not be over-pressed, as neither species is absolutely monophagous. Spormann (Progr. Gymn. Stralsund, 1909, p. 8) tells us that Prof. Stange, who "rightly holds *variata* and *obeliscata* to be different species, found larvæ of the latter on *Juniperus* and *Larix*, as well as on pine"; while *Pinus picea* would appear to be shared as an occasional substitute food-plant by both species (*cf.* Hoffmann, Stett. Ent. Zeit. xlix. 172 for *variata;* Barrett, Lep. Brit. Isl. viii. 356 for *obeliscata*—"rarely").

Postscript.—Since writing the above I learn that Major Robertson has also found the larvæ of *T. variata* on two other conifers, the Silver Fir (*Abies pectinata*) and the Norway Spruce (*Picea excelsa*). In a letter dated August 28th, he writes, "I have four or five pupæ of *T. variata*, 2nd brood, and other larvæ sleeved out seem to be feeding up rapidly."

"WHERE WALLACE TROD": BEING SOME ACCOUNT OF AN ENTOMOLOGICAL TRIP TO MT. SERAMBU, SARAWAK, BORNEO.

By J. C. Moulton, B.Sc., F.L.S., F.Z.S., F.E.S.,
Curator of the Sarawak Museum.

(Plates V. & VI.)

(Concluded from p. 217.)

The fortnight on the mountain went by all too quickly, as most entomological expeditions only too often do. If fine and a promising day generally, we would climb to the top and wait on a small cleared spot up there for insects to visit us, but generally clouds and rain developed, preventing any big captures there, although such spots are generally most productive in Sarawak. The clearing round our hut produced most insects, but we also tried the lower slopes of the mountain with varying success. At night time we were kept busy by the improvised light-trap, which we were told afterwards was easily visible from Bau, some four miles down the valley to the south-west of us; the light in our hut also attracted many moths. Sugar was tried, but without success. In our day at the birds'-nest caves on Mt. Jibong we were astonished at the numbers of cockroaches swarming on the sides of the caves and in the soft guano which filled the floor. These proved to be two species—*Ischnoptera cavernicola*, Shelford, and *Periplaneta australasiæ*, Fab. The place seemed alive with them, and, together with hundreds of screeching swifts, whirring bats, and the twinkling lights of the Dayaks, whom we could just discern high up in the roof above us, clinging to a frail bamboo scaffolding while they took the nests which are so highly prized by the Chinese epicure, formed an interesting scene not easily forgotten.

On Serambu we prepared heaps of rotten fruit, which attracted a certain amount of small insects.

The small clearing made round our hut used to be quite gay with butterflies whenever the sun was shining brightly, and I longed to see an attractive row of flowers planted, so as to bring these beautiful creatures within easier reach of the net. As may be imagined, a chase in the jungle after any coveted species can only be of the shortest, as the undergrowth and uncertainties of the ground, once you leave a path, occupy all one's attention. Among the butterflies caught or noticed were the following:—

NYMPHALIDÆ.—Danaini: the big, lazy-flying *Hestia lynceus*, Drury, *Ideopsis daos*, Boisd., and *Danais aspasia*, Fab. Euplœini: *Euplœa claudius mulciber*, Cr., common. Satyrinæ: species of *Mycalesis*, *Ypthima* and *Erites*; a large *Melanitis*, apparently nearest to *zitenius*, Herbst., which may be distinguished from the only other Bornean *Melanitis* (*M. ismene*, Cr.), so common in Sarawak, by the presence of an orange apical band on fore wing instead of the eye-spot below the apex of fore wing; in the Serambu specimen there is a faint orange apical band. Elymniinæ: *Elymnias nigrescens*, Butl., was very common in sunny clearings on the hillside; one *E. lais*, Cr., was taken. Amathusiinæ: *Zeuxidia amethystus*, Butl., *Z. doubledayi*, Westw., and *Amnosia baluana*, Fruhst., were taken near our hut in the shady part of the jungle; *Thaumantis aliris*, Westw., the largest and most showy butterfly to be found in Borneo, except perhaps the big *Troides* species (Papilioninæ), was seen two or three times, once feeding on the remains of a dead chevrotain.

The Nymphalinæ noted were: *Cupha erymanthis lotis*, Sulz., *Cethosia hypsea*, Doubl. and *Neptis* spp.; *Hypolimnas anomala*, Wall., was common on the sunny paths at the foot of the mountain, and easily distinguished in flight and at rest from its Euplœine models, although both Euplœine and Nymphaline are characterized by a slow fearless flight. I noticed the *Hypolimnas* almost invariably settled (or else immediately oriented itself) so that its wings were outspread on a leaf with its head nearest to or actually on the edge of the leaf, the hinder part being nearest the base or midrib of the leaf; I suppose this position enables it to fly off at quicker notice, and it is thus less likely to be surprised. The dark Euthalias seemed to similarly orient themselves, and at first I thought it was in order to obtain the full glare of the sun, but came to the conclusion that the sun had nothing to do with it. Time after time I watched them fly towards a leaf, settle, "about turn," and there they were "facing the enemy" in the same way that *Hypolimnas* did. There is more point in this action with the Euthalias, as the males of the three commonest species in Sarawak have light blue-grey hind marginal borders to both wings, which effectively merge in the ground colour of the leaves on which they rest, thus leaving a dark patch at the tip or edge of the leaf which might well be taken for a piece eaten out of the edge or off the end of the leaf. The females are less often seen, and I could make no observations on their rest attitudes.

The large Nymphaline, *Parthenos sylvia borneensis*, Staud., occasionally flew by at a great speed. One example of another swift-flying Nymphaline, rather Hesperid-like in flight, was taken, *Dicchoragia nesimachus mannus*, Fruhst.; this is a rare species in Sarawak. *Athyma nefte nivifera*, Butl., and *A. abiasa*, Moore, were common. *Adolias canescens*, Butl., was taken. The celebrated leaf-butterfly, *Kallima inachis buxtoni*, Moore, was seen to settle on the trunk of a tree, but it evaded capture.

Lemoniidæ. — *Zemeros emesioides eso*, Frust., and *Laxita orphna*, Boisd., both common species, were taken.

Lycænidæ. — *Megisba malaya*, Horsf., *Lycænopsis plauta*, Druce, *Neopithecops zalmora*, Butl., *Lampides zebra*, Druce, *L. coruscans*, Moore, *L. celeno*, Cr. (a dwarf measuring only 21 mm. across the wings), *Everes argiades*, Pall., *Dacalana vidura*, Horsf. (a pair taken *in cop.*), two examples of *Horaga affinis*, Druce, which is a rare mountain species confined to Borneo; and a male of the pretty little *Sinthusa amata*, Dist., also a rare species in Sarawak.

Papilionidæ.—The Pierines noted were *Terias hecabe*, L., *T. sari*, Horsf., *Catophaga plana*, Butl., and *Delias metarete*, Butl., a specimen of this last species with a large piece removed from anal half of right hind wing and anal quarter of left hind wing, evidently bitten out by some bird or lizard enemy. Two species of Papilioninæ, *P. helenus palawanicus*, Staud., and *P. nephelus saturnus*, Guér., were frequently seen. A male of the former was taken with a large piece removed from the greater part of the left hind wing, and the inner margin of the right hind wing also bitten away. Another Papilio, *P. aristolochiæ antiphus*, Fab., was taken, showing a large symmetrical bite removing tailed portion of both hind wings.

Two Hesperids, *Tagiades waterstradti*, Elwes, and *Parnara moolata*, Moore, were taken.

The moths, so far as I can identify them from the collection in the Sarawak Museum, include the following. There are, however, many others which I have not been able to identify up to the moment of writing. The majority of the following were taken at light:—

Syntomidæ.—*Syntomis egenaria*, Wlk.

Arctiidæ.—*Nishada rotundipennis*, Wlk., *Ilema tortricoides*, Wlk., *I. plagiata*, Wlk., *I. costalis*, Wlk., *I. apicalis*, Wlk., *I. vicaria*, Wlk., *Padenia duplicana*, Wlk., *Darantasia cuneiplena*, Wlk., *Chionæma pudens*, Wlk., *C. conclusa*, Wlk., *C. subornata*, Wlk., *C. bianca*, Wlk., *Asura obsoleta*, Moore, *A. cuneifera*, Wlk., *A. euprepioides*, Wlk., *A. stringipennis*, Sch., *A. bizonoides*, Wlk., *A. uniformeola*, Hmpsn., *Miltochrista cuneonotata*, Wlk., *M. cruciata*, Wlk., *M. rubricostata*, Sch., *Eugoa æqualis*, Wlk., *E. vagigutta*, Wlk., *Hemonia orbiferana*, Wlk., *Diacrisia strigatula*, Wlk.

NOCTUIDÆ. — *Ancara obliterans*, Wlk., *Flammona quadrifasciata*, Wlk., *Toxocampa dorsigera*, Wlk., *Aquis viridisquama*, Wlk., *Doranaga leucospila*, Wlk., *Ariola continua*, Wlk., *Risoba diversipennis*, Moore, *Nyctipao crepuscularis*, L., *Baniana crinigera*, Swinh., *Bocula quadrilineata*, Wlk., *Remigia frugalis*, Fab., *Simplicia schaldusalis*, Wlk., *S. butesalis*, Wlk., *S. circumscripta*, Wlk., *S. robustalis*, Guén., *Adrapsa geometroides*, Wlk., *Bocana silenusalis*, Wlk., *Bertula cassiusalis*, Wlk., *B. alphusalis*, Wlk., *Nodaria nigripes*, Hmpsn., *N. erecta*, Moore.

LYMANTRIIDÆ.—*Orgyia nigrocrocea*, Wlk., *Lymantria similis*, Moore, *L. albicans*, Wlk., *Euproctis guttistriga*, Wlk., *E. guttulata*, Snell., *Redoa marginalis*, Wlk.

AGANIDÆ.—*Asota heliconia*, Butl.

SPHINGIDÆ.—*Daphnusa ocellaris*, Wlk.

CYMATOPHORIDÆ.—*Thyatira batis*, L.

NOTODONTIDÆ.—*Phalera sangana*, Moore.

GEOMETRIDÆ.—*Peratophyga venetia*, Swinh., *Luxiaria ditrota*, Meyr., *L. undulataria*, Pag., *L. nigripalparia*, Wlk., *L. turpisaria*, Wlk., *Zamarada translucida*, Moore, *Hyposidra talaca*, Wlk., *Ophthalmodes clararia*, Wlk., *Boarmia compactaria*, Wlk., *B. costaria*, Guén., *B. separata*, Wlk., *Panæthia maculifera*, Wlk., *Pomasia vernacularia*, Guén., *P. conferta*, Swinh., *Craspedia walkeri*, Butl., *C. actuaria*, Wlk., *Problepsis deliaria*, Guén., *Agathea codina*, Swinh., *Hemithea graminea*, Hmpsn., *Thalera unifascia*, Hmpsn.

LIMACODIDÆ.—*Miresa bracteata*, Butl.

ZYGÆNIDÆ.—*Chalcosia ficta*, Wlk.

PYRALIDÆ.—*Ramila acciusalis*, Wlk., *Vitessa suradeva*, Moore, *Ambia marginalis*, Moore, *Piletocera ægimiusalis*, Wlk., *P. tellesalis*, Wlk., *Mabra fauculalis*, Wlk., *Eurrhyparodes bracteolalis*, Zell., *Agrotera effertalis*, Wlk., *A. barcealis*, Wlk., *Ætholix flavibasalis*, Guén., *Ercta elutalis*, Wlk., *Bocchoris telphusalis*, Wlk., *Dichocrocis clioalis*, Wlk., *D. pandamalis*, Wlk., *D. megillalis*, Wlk., *Nacoleia pœonalis*, Wlk., *N. insolitalis*, Wlk., *N. marionalis*, Wlk., *Sylepta multinealis*, Guén., *Glyphodes glauculalis*, Guén., *G. navalis*, Feld., *Pilocrocis anigrusalis*, Wlk., *Pionea aureolalis*, Led.

Among insects of other Orders captured or noticed were the following :—

RHYNCHOTA.—Cicadidæ : *Scieroptera crocea*, Guér., and *Maua albiguttata*, Wlk. I think it was another example of this latter species that I tried to catch on a branch of a tree whither I had been attracted by its shrill song. It flew off and continued its song for a moment or two while in flight, much to my surprise, as I always thought a position of rest was necessary before any Cicadas could make a noise. It returned later to the same tree, but I again missed it with the net, although it allowed me to approach near enough to approximately identify it.

Four Fulgoridæ were noted—*Thessitus nigronotatus*, Stål, *Pochazia fuscata*, Fab., *Ricania convergens*, Wlk., and *R. limitaris*, Wlk. Also five Cercopidæ—*Suracarta tricolor basinotata*, Butl., *Tricoscarta delineata*, Wlk., *Phymatostetha stellata*, Guér., *P. dislocata*, Wlk., and *Opistharsotheus simulans*, Schmidt. Specimens of the two common Jassids, *Bhandara semiclara*, Sign., and *Tettigoniella farinosa*, Fab., were brought in by the collectors. The Pentatomids, *Chrysochoris auratus*, Guér., *Dalpada oculata*, Fab., *Plautia fimbriata*, Fab.; the Reduviid, *Centrocnemis signoreti*, Stål; the Coreid, *Serinetha abdominalis*, Fab.; and a Lygæid, *Narbo biplagiatus*, Wlk., were taken.

Coleoptera.—Perhaps the most striking species taken were a large brilliant green Buprestid, *Chrysodema pyrosticta*, Vollen., and a fine chocolate-brown Curculionid, which I found walking on a large rock on the summit of the hill; this proved to be a rare species recently described by Dr. K. M. Heller as *Polriophorus stellatus*.

Among the Longicorns were—(Lamiidæ), *Leprodera fimbriata*, Chev.; a large brown-spotted beetle, *Himantocera plumosa*, Oliv.; *Entelopes glauca*, Guér., surely a mimic of some Coccinellid-Cassid combination; *Praonetha quadraticollis*, Pasc.; and a pair of a gorgeous blue species, *Glenea celia*, Pasc., which I took *in cop.* on a fallen tree. Mr. Gahan kindly identified it for me, and I understand it has not been recorded from Borneo before. (Cerambycidæ), the common red *Euryphagus lundii*, Fab., *Xylotrechus pedestris*, Pascoe, and *X. scenicus*, Pasc.

The brilliant little Cassidæ were represented by *Aspidomorpha sarawacensis*, Spaeth, and *Laccoptera 13-punctata*, Fab. Two species of Carabidæ were taken—*Orthogonius vittatus*, Main, and *Dischissus cereus*, McL., the latter a rare species in Sarawak. The pretty little Cicindelid, *Odontachila* (*Heptadonta*) *analis*, Fab., was common on the sandy path at the foot of the mountain, flying in the sun, together with the ubiquitous *Cicindela aurulenta*, Fab., which is certainly the commonest beetle in Sarawak.

One Endomychid, *Eumorphus consobrinus*, Gerst., and one Lampyrid, *Luciola pallescens*, Gorh., were taken.

Sugaring trees was tried, but, as on previous occasions out here, proved a total failure, possibly owing to moonlight nights, but more likely due to the swarms of ants which were always in a great hurry for first place. Among them was that large species, *Camponotus gigas*, Latr., of which the big headed soldiers, measuring an inch in length from head to end of abdomen, used to appear at night, though we never saw them in the daytime. One of the Dayak collectors, annoyed at seeing several visitors of this kind instead of the desired moths, hit one with a stick, bursting the bladder-like abdomen, whereupon some fluid squirted out and into his eye! He had a very painful two days before his eye got all right again. A few earwigs attended the sugar repast; they were *Allodahlia scabriuscula*, Serv., *Cordax forcipatus*, de Haan, *Timomenus vicinus*, Burr, and *Opisthocosmia centurio*, Dohrn.—all common species in Sarawak.

Sarawak: April, 1912.

Explanation of Plates V. & VI.

Pl. V., fig. 1.—Mr. H. W. Smith and Dayaks on the actual site occupied by Wallace in 1856. Note two posts of house in foreground, and the density of jungle grown up since the house was last occupied.

„ fig. 2.—The same spot after being cleared by Dayaks. Our hut in process of erection.

Pl. VI., fig. 3.—Our improvised moth-trap. Collector (Sea-Dayak) standing with Land-Dayak boy seated in front.

„ fig. 4.—The huge rock (referred to by Wallace, St. John, and Beccari), under which we obtained water for drinking and bathing purposes.

APPENDIX.

By W. L. Distant.

Mr. Moulton has asked me to identify the four following species of Rhynchota which he collected on this expedition, two of which are apparently undescribed, and the types are now in the British Museum.

Fam. Pentatomidæ.

Dalpada trimaculata.

Pentatoma 3-maculata, Westw., in Hope Cat. i. p. 41 (1837).

Already recorded from Java, Sumatra, Borneo, and Philippines.

Hippotiscus scutellatus, sp. n.

Body above ochraceous, thickly darkly punctate; apex of scutellum cordately ivory white, inwardly margined with black; body beneath pale ochraceous, the segmental incisures, spiracles, and a transverse line beneath them dark castaneous; prosternum punctured with castaneous; legs darker ochraceous; head short, broad, almost shorter than broad between the eyes, rounded at apex, the margins moderately laminately reflexed, the lateral lobes slightly longer than the central; first joint of antennæ about reaching apex of head, second longer than third, fourth and fifth longest and subequal, first, second, and third joints ochraceous, fourth and fifth dark castaneous; rostrum castaneous, not extending beyond the intermediate coxæ; pronotum with the lateral margins rounded and laminate, anterior angles obtusely angulated, basal angles rounded and subprominent; membranal veins simple; abdomen not spined at base, but second segment slightly convexly elevated at centre; mesosternum centrally carinate. Long. 13 millim. Exp. pronot. angl. 2 millim.

This genus was previously represented by a single Indian species.

Halyomorpha picus.

Cimex picus, Fabr., Ent. Syst. iv. p. 115 (1794).

A species common to the Oriental and Malayan regions, and found in China and Japan.

Glaucias montivagus, sp. n.

Above bright olivaceous green; head and anterior area of pronotum—concavely extending to the lateral angles—pale testaceous; head with the margins narrowly, a puncture on each side of the central lobe near eyes, and about four small spots near base, black; pronotum with about anterior half of the lateral margin blackly punctate, a few scattered black punctures on the pale testaceous area, and a series of black punctures on the anterior margin of the olivaceous green basal area; antennæ with the first, second, and third joints virescent, apex of the third black, fourth and fifth subtestaceous, about apical third of fourth and nearly apical half of fifth black, third, fourth, and fifth joints subequal in length; body beneath and legs virescent, paler than above; abdomen with a series of small black spots on the lateral margins at the apices of the segmental incisures; posterior area of pronotum, scutellum, and corium thickly punctate; membrane pale, hyaline; rostrum with the apical joint mutilated in type, second and third joints almost equally long; mesosternum distinctly carinate. Long. 13 millim. Exp. pronot. angl. 7 millim.

In colour and markings allied to *Z. beryllus*, Fabr., var *crassa*, Westw., but a smaller species with the head more slenderly elongate and considerably more narrowed at apex.

Coleoptera Collected on the J. C. Moulton Expedition to Sirunbu (Sarawak).

(Determined by C. J. Gahan.)

Longicornia.—*Glenea pustulata*, Thoms. (one female). *Pterolophia* sp. (one male ?); *melanura*, Pasc., var.

Halticidæ.—*Chalænus* sp. (one male); not in B. M. Coll.

Carabidæ.—*Lesticus* sp. (two males, one female); not in B. M. Coll.

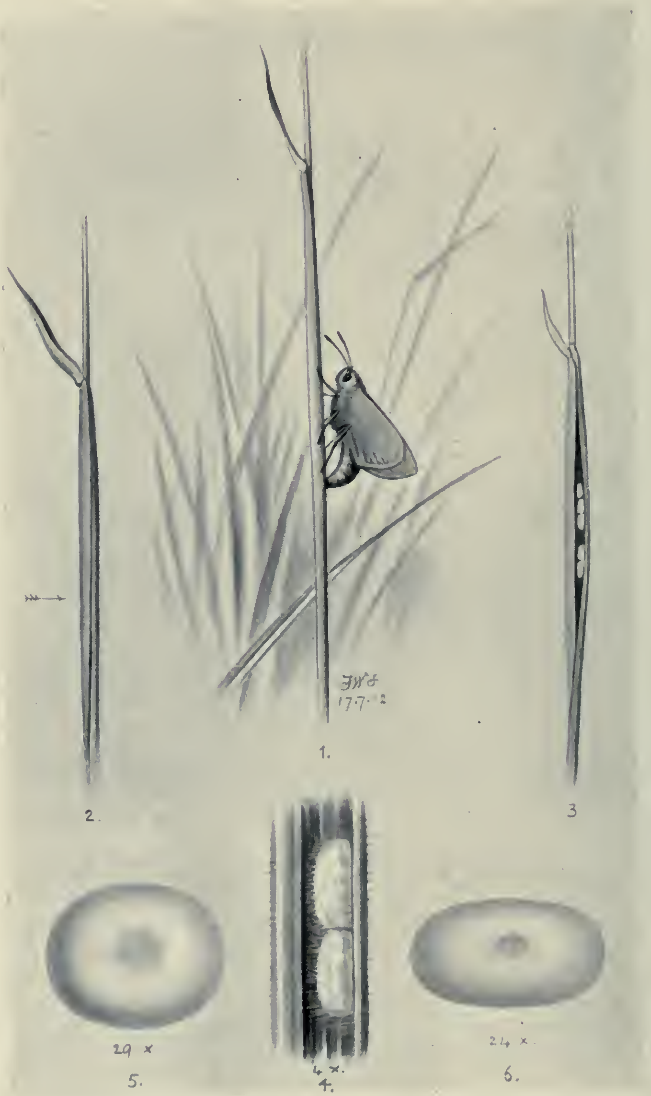
Curculionidæ.—*Poteriophorus bowringi*, Waterh., var.

(Determined by J. J. Arrow.)

Rutelidæ.—*Peltonotus vittatus*, Arrow. The two female specimens differ slightly in marking from the unique type in M. Oberthür's collection. The male must be awaited for the positive determination of the species (J. J. A.)

The Entomologist, September, 1912.

Plate VIII.



F. W. Frohawk del.

West, Newman proc

EARLY STAGES OF HESPERIA LINEA.

ON THE EGG-LAYING AND EARLY STAGES OF *HESPERIA LINEA* (= *THAUMAS*).

By F. W. Frohawk, M.B.O.U., F.E.S.

(Plate VIII.)

After repeated attempts to obtain the eggs of *Hesperia linea* from captive females, I determined, if possible, to watch this species depositing in a state of nature, not only for the purpose of securing eggs, but to ascertain the cause of so many failures in trying to get them to lay in captivity. I therefore, in company with my friend Mr. Ed. Goodwin, visited a certain locality on the Kentish Hills, where this butterfly is abundant, on July 17th last, purposely to make observations on this species, and to collect the larvæ of *Lycæna minima*. After watching *Hesperia linea* for a short time, we soon had the satisfaction of seeing three females deposit between 3.45 and 4.30 p.m., and found the eggs of each. To lose no opportunity I made a sketch on the spot of the first female we saw in the act of depositing, the drawing of which is reproduced in the accompanying plate.

The two species of grass selected by the butterflies for their eggs were cat's-tail grass (*Phleum pratense*), and soft creeping grass (*Holcus mollis*). All three females went through precisely the same performance and mode of depositing. After flying with a slow, steady, buzzing flight in and out among the taller stems of the mixed grasses growing in a dense mass of varied herbage in a wild uncultivated sheltered slope on a chalk hill, the butterfly now and again settled for a moment on a grass-stem, but obviously not suited for its eggs, would quickly fly off and settle on another, if suitable; she would settle on the upper sheath, and immediately slide down tail first, and at once start feeling for the division along the sheath with the ovipositor, working partly or wholly round it, and slowly crawling upwards during the process until it found the exact place to suit its requirements, in the choice of which it seemed very particular; it then rested with its wings closed over its back, antennæ lowered in a line with its body, and the abdomen curved, with the extremity closely pressed on, or just in, the crevice of the sheath, and the ovipositor deeply inserted. In this attitude she remained for three or four minutes, when I sketched her. While thus resting she laid four eggs in a row along the inner surface of the sheath opposite the aperture, quite hidden from view.

After watching this one we noted both the other females behaved precisely the same in their actions. The first one laid four eggs, the second three, and the third one three; but I found six were laid close together in one sheath, but afterwards these proved to be the eggs of two females, as three of them hatched several days in advance of the others. It appears that the normal number of eggs laid at a time is from three to five, as I afterwards gathered some grass-stems in which I found fourteen more eggs, all laid in rows in three different sheaths of five, five, and four respectively. After depositing the butterfly gradually raises the abdomen from the grass-stem, opens its wings, and after resting about a minute flies off.

I also captured six females for the purpose of obtaing more eggs; these, as well as others, I placed on growing plants of *P. pratense* and *H. mollis*. On July 31st I examined the plants, and found in the sheaths over fifty eggs, laid in a similar way to those laid by the wild females, but not a single egg was laid on any other part of the plant.

In previous trials to obtain eggs I had only provided the butterflies with younger growing plants without flowering stems, and as this species will only deposit its eggs in the sheaths of the flower-stalks, the cause of failure is at once apparent.

The egg of *H. linea* measures $\frac{1}{30}$ in. across its greater diameter, of a compressed oval shape, about half the width in height; it is much more rounded in form than either *H. actæon* or *H. lineola*. The micropyle is rather sunken and finely reticulated, and the rest of the surface is covered with extremely delicate reticulations of an irregular network pattern, which is only practically visible in high light; otherwise the shell has the appearance of being smooth and glistening with rather an opalescent lustre.

When first laid it is pearly white, faintly tinged with primrose-yellow. It remains unchanged for some days, and then gradually becomes a deeper ochreous yellow, afterwards again becoming paler, of a greyish pearly hue, when the larva is clearly visible through the delicate shell, its dark head showing as a leaden blotch.

Some of the wild eggs found on July 17th started hatching on August 3rd; those laid on that day (July 17th) began hatching on August 9th, remaining twenty-three days in the egg-state.

The young larva directly after emergence measures while crawling $\frac{1}{14}$ in. long. The head is pale olive-ochreous, roughly granular, and beset with a few white hairs; eyes pale, surrounded with blackish; the clypeus outlined with dark brown. The body is stoutest in the middle and tapering posteriorly; on the first segment is a dorsal, transverse, chitinous band of a similar surface and colour as the head. The segments have five subdivisions, the first on each segment being the widest; the second one runs below the spiracle, where it curves and runs off to the anterior segmental division. There are three subdorsal shining brown discs, each bearing a minute curved hair, placed in a triangle on each segment above the spiracle, and two others below; a few minute simple hairs are scattered over the ventral surface and on the anal extremity. The surface is roughly granulated, and of a pale citron-yellow colour.

The larva eats almost all the shell after emerging, only leaving a portion of the base adhering to the surface of the sheath. Shortly after emergence the young larva commences spinning itself over with silk until it is completely enveloped in a little dense, elongated oval, white cocoon, spun in the same spot where the egg is laid, so that a row of cocoons takes the place of the eggs, the little larvæ not moving from where they hatched. In these compact cocoons the larvæ are completely hidden and protected for hibernation. In this respect, excepting its near ally, *H. actæon*, which I shall later on fully describe, this very remarkable habit of *H. linea* is unique among our native butterflies, and is a wonderful provision for the preservation of the species; as the eggs are but slightly fixed to the surface of the sheath on which they are laid, they become detached if only very lightly touched, and upon the decaying of the grass during winter, when it would become fractured and split up, the eggs would fall out and perish on the ground in consequence; but Nature has provided safety for the species by the self-preservation of the larva to construct an indestructible covering incapable of dislodgment from its site, in which it can safely remain concealed throughout the winter months, and in the spring, when the fresh, tender blades of the grass-plant spring up among the fallen flower-stalks and sheaths, the little larva, on awakening, can then find its natural food—at least, this appears to me to be the obvious reason of the necessity of this wonderful provision.

In Buckler's 'Larvæ of British Butterflies,' pp. 195–6, Hellins states that on July 29th, 1865, Dr. Knaggs sent him "the eggs of this species laid in a row in folded grass, but how he managed to get the butterfly to lay them I do not know. The larvæ hatched on August 12th; most of them soon disappeared, but one survived until the middle of November; it was then only about 2 mm. in length, so I must have mismanaged it." Also he mentions being unable to obtain a single egg from numbers of these butterflies in captivity; but the first egg he squeezed from each dead butterfly proved fertile, and "the larvæ began to hatch August 15th; they soon spun little ropes of silk across the blades of grass, and made little web coverings for themselves, but they would not feed, and an accident soon befel their cage, and I saw them no more."

Both from Hellins' description of the egg and his account of the site of egg and habits of the young larvæ, it is not at all conclusive if he had under observation *H. linea* at all, although it appears impossible that he could be mistaken in the identity of the specimen he squeezed eggs from; but one point is, I think, certain, *viz.* he described the egg of *H. actæon* for that of

H. linea, which he describes "of a long oval figure half as long again as wide," which is correct for the egg of *actæon*, that so greatly differs in this respect from the egg of *H. linea*, which is so very much rounder in form, being only one-fifth longer than broad, whereas that of *H. actæon* is, as Hellins states, half as long again as wide. For the purpose of comparison I have given figures of the eggs of both species. As will be seen, the difference in shape between the two is so vastly different that it affords a ready means for immediate identification.

(To be continued.)

Explanation of Plate VIII.

Fig. 1.—*Hesperia linea* depositing; flower-stem of *Phleum pratense* sketched from life, 3.45 p.m., July 17th, 1912.

Fig. 2.—Flower-stem sheath of *Holcus mollis*; arrow-head denoting eggs *in situ* within sheath.

Fig. 3.—Larval cocoons (natural size); sheath opened to show cocoons.

Fig. 4.—Larval cocoons, enlarged 4 ×.

Fig. 5.—Egg of *H. linea*, enlarged 29 ×.

Fig. 6.—Egg of *H. actæon*, enlarged 24 ×.

OVIPOSITION OF *TAPINOSTOLA CONCOLOR.*

By G. B. Kershaw, F.E.S.

Whilst working for this insect this year, about 8.45 p.m. I came across a female, evidently freshly emerged, clinging to a sedge-leaf. At 9.30 p.m. a male of the same species came up and paired with the female. After an interval of ten minutes the pair were very carefully secured in a three-inch glass-bottomed pill-box, together with the sedge-leaf on which they were resting; they were then left on the ground, still paired, until 1.30 a.m. the next morning, when they were found separated.

Both the insects were transferred to a large glass jar covered with muslin and containing a good supply of food-plant, the cut stalks being wrapped in wet cotton wool to avoid shrivelling. On examining the sedge-leaf cut off by the pill-box lid (referred to hereafter as "A"), it was seen to be dried up, and the edges were curled over towards the middle of the leaf on each side; on gently opening the curled-up portions, thirteen ova were found concealed on one side of the leaf, all neatly deposited in a row, touching each other, and cemented to the leaf.

The ova were globular, glistening, and of a yellowish white colour, and measured about one thirty-second of an inch in diameter. The insects in the glass jar were placed amongst herbage during the day, and hid up amongst the sedge close to the bottom of the jar. They were visited several times during the day, but did not move until about 9 p.m. on the evening following their capture, when one of the insects (the male, as it subsequently turned out) became restless, and commenced "buzzing" up and down the sedge-leaves, the female remaining perfectly quiescent. The male was then removed to a second glass jar supplied with sedge. About 9.30 p.m. the female began to ascend the sedge, creeping quietly about examining the blades, and having finally selected a particular blade as being suitable for her purposes, commenced ovipositing about one and a half inches from the extreme tip, and along the very edge of the leaf. About this time the light became too uncertain for further observation, and on trying to observe further with a lamp, the female commenced "buzzing," so she was left undisturbed, whilst the male in the second jar was killed. The following day, about 8 a.m., the ova which I had seen deposited the previous evening were invisible, the leaf having curled over and completely hidden them from view. The sedge had already dried somewhat, but doubtless the cement provided by the female during oviposition hastened during its setting period the curling of the leaf.

After being left undisturbed (after a railway journey) for five days, the female still being alive but much worn, she was removed and the sedges carefully searched for ova. Several batches were found, five in all: two lots ("B" and "C") were laid about the middle of a blade, and three ("D," "E," and "F") about one and a half to two inches from the extreme tip. In batch "B" the ova (sixteen in all), were laid in two rows parallel to and touching each other, and this was also the case with "C," five ova being laid. With respect to "D," the ova (seven) were similarly placed to those in "A," but with "E" and "F" (seven and eleven respectively) one ovum, although in the same straight line as the others, was separated from the main row by an interval of one-eighth of an inch.

Several of the ova appeared either to have shrunk or to have been distorted by the pressure of the incurling leaf, and this would appear to afford strong presumptive evidence that the cement or gum greatly accelerates the curling tendency of the leaf, since one might reasonably assume that the distortion of the ova occurs soon after this is deposited, *i. e.*, when the envelopes of the ova are still delicate and flexible.

The double row of ova at the middle of the leaf "B" (*i. e.*, where the breadth is about four times that of the leaf one and a half inches from the extreme tip) is significant.

With reference to "E" and "F" it would appear possible that the female inserted her ovipositor into the blade when it was already somewhat curled, and after laying one egg for purposes of taking bearings at, so to speak, the limit, withdrew the ovipositor an eighth of an inch before laying the remainder.

The weather the evening the insects were taken was very warm and close, following heavy rainfall, the shade temperature at 8 p.m. being 68° F.

It remains to be seen whether it will be possible to observe anything further with regard to the life-history of this insect, since the accredited food-plant is not particularly easy to obtain, and difficult to transplant when met with.

West Wickham, Kent.

NEW SPECIES OF LEPIDOPTERA FROM FORMOSA.

By A. E. Wileman, F.E.S.

Geometridæ.

Paradarisa rantaizanensis, sp. n.

♂. Fore wings pale brown, freckled with darker, clouded with dusky on outer third, ochreous tinged, especially on costal and dorsal areas; antemedial line blackish, double, diffuse; postmedial line blackish, angled opposite cell, bent near dorsum; discoidal mark linear, blackish, some blackish specks between it and dorsum; subterminal line pale, wavy, indistinct; terminal line crenulate, blackish, with black dots on it between the veins. Hind wings pale brown, freckled with darker; antemedial line blackish, only distinct on dorsal area; postmedial line blackish, double, not extended to costa, slightly incurved before dorsum, followed by a dusky shade; subterminal and terminal lines as on fore wings, but the former rather more distinct. Under side whitish, clouded with dusky on outer third; all the wings have blackish discoidal spot and postmedial line, the latter rather faint.

Expanse, 43 millim.

Collection number, 789*a*.

Allied to *P. comparataria*, Walker, from N.W. Himalayas.

A male specimen from Rantaizan, May 8th, 1909.

Arichanna (?) *maculosa*, sp. n.

♂. Antennæ bipectinate. Fore wings white, thickly sprinkled with dark brownish; venation brownish; antemedial and postmedial lines blackish, double, broad and rather wavy, interrupted; a blackish band, on which is a black discoidal spot, between antemedial and postmedial lines, but nearest the latter, interrupted about middle; subterminal and terminal lines blackish, macular; a blackish cloud on terminal area near apex. Hind wings white, finely sprinkled with dark brownish. Fringes of all wings whitish checkered with blackish, most distinctly on the fore wings. Under side similar to above, but the transverse markings of the fore wings confluent.

♀. Except that the hind wings are more densely sprinkled with dark brownish, similar to the male.

Expanse, 39 millim.

Collection number, 806.

One specimen of each sex from Arizan, September 12th, 1906.

Vindusara rectifascia, sp. n.

♀. Fore wings white; antemedial and postmedial bands pale brownish, powdered with white, the former curved and the latter straight; a pale brownish spot before antemedial line, and two similar coloured spots on costal area just beyond the antemedial, and two or three others beyond the postmedial band. Hind wings white, with four large and some small scattered pale brownish spots on the basal three-fourths; postmedial band pale brownish, outwardly edged by a yellowish cloud in which are three black dots, extending to termen between vein three and tornus. Fringes of all wings brown. Under side similar to above, but there are more spots beyond the postmedial band of fore wings.

Expanse, 50 millim.

Collection number, 1561.

A female specimen from Kanshirei, May 7th, 1908.

Pachyodes taiwana, sp. n.

♂. Antennæ bipectinated, except apical fourth; abdomen with flattened tufts of brownish hairs on middle segments. Whitish grey, sprinkled with brownish grey, and striated with blackish. Fore wings with black basal and antemedial lines, both slightly curved near costa, thence almost straight to dorsum, space between the lines without black striæ; discoidal mark black, linear; postmedial line blackish, wavy, diffuse towards costa, bluntly angled above middle, incurved below middle; subterminal line blackish, indistinct, followed by whitish patches below apex and about middle; terminal line black, interrupted. Hind wings have blackish discoidal mark and postmedial line, the latter bluntly angled at vein four, thence wavy to dorsum; terminal line black, interrupted. Under side white; a black postmedial band on all the wings, the outer edge of the band irregular; a black discoidal mark on fore wings similar to that on upper side.

Expanse, 48–50 millim.

Collection number, 1555.

Near *P. crassistriga*, Warren.

Two male specimens from Kanshirei, April 28th, 1908.

NOTODONTIDÆ.

Phalera flavimacula, sp. n.

♂. Head chocolate-brown, crown yellowish buff, collar chocolate-brown mixed with grey; thorax pale grey flecked with darker; abdomen grey, anal tuft yellowish buff. Fore wings pale grey, striated and mottled with darker grey, clouded with dark grey on the costal area; some black dots on costa before apex; reniform and orbicular spots pale, outlined in black; a black mark below the orbicular spot; a patch of yellowish buff on terminal area, inwardly bordered by a chocolate-brown curved band; fringes reddish brown traversed by a greyish line, preceded by a connected series of black lunules. Hind wings whitish suffused with fuscous, except on dorsal area; discoidal spot and postmedial line dusky. Under side blackish, with yellowish buff patch as above, on fore wings; whitish, freckled with brown chiefly on costal area, black discoidal spot, and blackish somewhat interrupted postmedial line, on the hind wings.

Expanse, 40 millim.

One male specimen from Arizan.

Noctuidæ.

Trachea subfusca, sp. n.

♂. Fore wings greyish brown, suffused with fuscous; four pale brown dots on costa towards apex; orbicular and reniform stigmata hardly paler than the general colour, partly outlined in black, space between them blackish; antemedial line black, sinuous, indistinct towards dorsum; postmedial line black, dentate, curved round end of cell, outwardly edged with pale brown; veins marked with black on terminal area; subterminal line pale brown, fairly distinct on costa, continuation indicated by dots on the veins. Hind wings pale brown, suffused with blackish, fringes paler. Under side pale brown, powdered with darker, chiefly on fore wings and outer area of hind wings; a dusky postmedial line on all wings, and a blackish discoidal spot on hind wings; four pale brown marks on costa of fore wings beyond postmedial.

♀. Similar to the male, except that the antemedial line is more distinct.

Expanse, ♂ 46 millim.; ♀ 48 millim.

One example of each sex from Kanshirei; male, August 14th, 1907; female, August 17th, 1905.

NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

By F. W. Edwards, B.A., F.E.S.

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(Concluded from p. 220.)

Genus 3. Aedes.

A. cinereus, Mg.—Scales of head broad and flat, except for a patch of narrow ones behind, extending in front in a narrow median area to the eyes. Scales yellowish, but two patches of black ones, variable in size. Thorax reddish, clothed with golden-brown scales. Abdomen blackish-brown above, sides and venter pale ochreous. Legs and wings with dark brown scales, femora pale beneath. Average length, 5 mm.

Probably fairly common. I have seen specimens from Wicken, Chippenham, and Baitsbite (Cambs); New Forest; Bournemouth; Studland (Dorset); Crymlin Bog (Glamorgan); Ormesby (Norfolk). Mr. J. E. Collin has it from Tuddenham (Suffolk) and Edinburgh.

There may be two nearly allied species here, as Theobald describes the hind claws as being simple; this, however, is very likely an error. Kertesz states that they are toothed, and this agrees with my observations. A specimen of Zetterstedt's *Culex nigritulus* lent to me for examination was a typical *A. cinereus*; this confirmed a suspicion I had previously entertained that the two names apply to the same species.

Genus 4. TÆNIORHYNCHUS.

1. *T. richiardii*, Fic.—A rather obscure-looking insect, but easily distinguished from the other British species by having *all* the wing-scales rather broad; the wings are speckled as in several species of *Ochlerotatus*. Thorax reddish-brown, with golden-brown scales. Abdomen blackish, unbanded, but with pale lateral spots. Legs speckled; indistinct pale rings at the bases of the tarsal joints, *and in the middle of the metatarsi*. Length about 6 mm.

Not common. Patching and Angmering ponds, Sussex, and Littlesea, Dorset (*Rev. A. E. Eaton*); Cambridge (*F. Jenkinson*); Sutton Coldfield (*R. C. Bradley*); Wye, Kent, and Norwich (*Theobald*).

Theobald's record of this species from Toronto really refers to *T. perturbans*, Walk., which is distinguished from *T. richiardii* by having a pale ring near the apex of the tibiæ. The name of this species is spelt wrongly in Theobald's monograph, and in the 'List of British Diptera' (1901).

Genus 5. THEOBALDIA.

1. *T. annulata*, Schrank.—Wings spotted as in *A. maculipennis*. Cross-veins in one line. Femora with narrow pale rings near the tip. Broad whitish rings at the base of each tarsal joint, and in the middle of the metatarsi. Segments of abdomen brown with whitish basal bands, the second segment with a median whitish longitudinal stripe. Average length, 7·5 mm.

Common. A particularly bad biter.

2. *T. morsitans*, Theo.—Wings unspotted. Cross-veins separated by nearly the length of the posterior. Proboscis and palpi of female black-scaled, the palpi white-tipped. Scales of thorax partly dark brown and partly golden, the golden ones tending to be arranged in longitudinal lines. Abdomen dark brown, the segments with broad whitish basal bands. Femora without pale rings. Tibiæ and metatarsi striped with yellowish white on the sides. Tip of metatarsus and second tarsal joint narrowly yellowish, broader yellowish areas at the bases of the first three, narrower ones at the bases of the last two tarsal joints. Metatarsus of the front legs of the male distinctly longer than the remaining four joints together (120 : 105). About seven teeth in the pecten of the air-tube of the larva, no spines beyond the pecten. Average length, 6·5–7·5 mm.

Probably common. Rochford, Essex; Patching and Angmering, Sussex; Woking, Surrey; Brockenhurst, Hants; Longner Hall, Shrewsbury.

3. *T. theobaldi*, Meij.—The adults are difficult to separate from those of *T. morsitans*, though the larvæ are very distinct. In the male of *T. theobaldi* the front metatarsus is scarcely at all longer than the remaining four joints together. In the female the proboscis has numerous pale scales, especially in the middle at the sides. Eight or nine teeth in the pecten of the larval air-tube, placed more transversely than in *T. morsitans*; five or six spines beyond the pecten. Meijere states that the larva is yellowish or greenish white, while that of *T. morsitans* is blackish grey. He also says that the air-tube of the larva of this species is relatively shorter and broader, but I do not find this to be the case. Figures 3 and 4 represent the larval air-tubes of *T. morsitans* and *T. theobaldi* respectively; they were drawn by my wife from specimens taken in the New Forest by Mr. C. O. Waterhouse, and mounted in balsam.

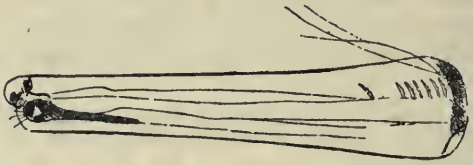

Fig. 3.—*Theobaldia theobaldi* (Meij.). Air-tube of larva.

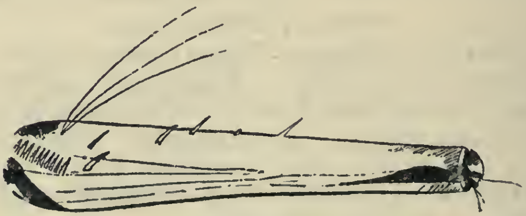

Fig. 4.—*Theobaldia morsitans* (Theo.). Air-tube of larva.

Quite as common as *T. morsitans*. Has been taken in Scotland at Dingwall, Cromarty (*Lt.-Col. Yerbury*).

The specimens described by Theobald (Mon. Cul. i. p. 335) as *Culex ficalbii* (so named by Prof. Grassi) are *T. theobaldi*, and were certainly, I think, wrongly named, as *C. ficalbii* was originally described as having spotted wings. Specimens answering Noè's description have been received at the British Museum from the Punjab; one of these was recorded by Theobald as *C. annulatus*. It is improbable that the true *Th. annulata* occurs in India.

Genus 6. CULEX.

1. *C. pipiens*, L.; the Common Gnat.—Thorax brick-red to dark reddish-brown. Abdomen dark brown, the segments with basal yellowish bands. Legs dark brown, the femora pale beneath. First fork-cell very long, quite four times as long as its stem. Average length, 5 mm.

Common everywhere.

A small dark variety (?) of this species has been described by Theobald as *Culex nigritulus*, Zett. It is certainly not *C. nigritulus*, which is a synonym of *Aëdes cinereus*, Mg. At first sight this variety appears to be totally distinct from *C. pipiens*, as it is much smaller (only 3–3·5 mm. in length) and darker, the thorax being without any reddish tint. No external structural differences, however, are observable, and after carefully comparing the larvæ of this and typical *C. pipiens* I could find no differences whatever. However, it seems worthy of a name, varietal if not specific, and I propose to call it *C. pipiens* var. *doliorum* (nov.). I found it swarming in water-barrels at Kingswear, South Devon, last autumn; all the adults were of uniform small size and dark grey-brown colour. The male genitalia differ from those of typical *C. pipiens* in having the basal process of the harpes quite well developed; I cannot detect the small third plate of the harpagones described by Dyar and Knab as characteristic of *C. pipiens*.

REPUTED BRITISH SPECIES.

Stephens records the following as British, but no recent examples have been found:—*Culex calopus*, Mg.; *C. ornatus*, Mg.; *C. domesticus*, Germar; *C. bicolor*, Mg.; *C. punctatus*, Mg.; *C. lutescens*, F.; *C. rufus*, Mg. With the exception of the first two, these have not been recognized by any recent author. Theobald regards *C. punctatus* as synonymous with *C. rusticus*, Rossi, and it was included in the last British List under this name.

Culex fumipennis, Stph., and *C. marginalis*, Stph., were originally described from Britain, but are probably unrecognisable unless from types.

KEY TO THE KNOWN LARVÆ OF BRITISH CULICINÆ.

1.	Air-tube absent	*A. maculipennis.*
	Air-tube present	2.
2.	Air-tube quite six times as long as its breadth in middle	3.
	Air-tube at most four times as long as its breadth in middle	5.
3.	Several scattered hair-tufts on air-tube . .	*Culex pipiens.*
	Only one tuft of long hairs close to base . .	4.
4.	Five or six smooth spines on air-tube beyond pecten	*Th. theobaldi.*
	No spines on air-tube beyond pecten . . .	*Th. morsitans.*

5. Hair-tuft close to base of air-tube; pecten teeth hair-like . . . . *Th. annulata.*
Hair-tuft near or beyond middle of air-tube; pecten teeth not hair-like . . . . 6.
6. Air-tube quite four times as long as broad; hair-tuft well beyond middle . . . . . . *A. cinereus.*
Air-tube less than four times as long as broad; hair-tuft near middle . . . . 7.
7. Pecten of air-tube with detached teeth outwardly *O. vexans* (*sylvestris*).
Teeth of pecten evenly spaced . . . . 8.
8. Hair-tuft in a line with the pecten . . . 9.
Hair-tuft not in a line with the pecten . . *O. diversus.*
9. Pecten with about 24 teeth, each with 4–6 serrations . . . . *O. cantans.*
Pecten with about 18 teeth, each with 1–2 serrations . . . . . . *O. nemorosus* and *O. dorsalis.*

The above table is mainly drawn up from specimens preserved in balsam by Mr. C. O. Waterhouse, taken in the New Forest and at Burnham Beeches. The larvæ of *O. vexans* have not been found, as far as I am aware, in Europe, but as the North American *sylvestris* is almost certainly the same, I have made use of the characters given for it by Dyar and Knab.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief Gervase F. Mathew, R.N., F.E.S., &c.

(Continued from p. 229.)

August 23rd was fine and warm. A boy brought me a fine large female *Sphinx convolvuli* which he had found on a bush. It was in a large wide-mouthed pickle bottle, had sustained no injury, and looked as if it had only just emerged. The first *T. amataria* of the brood mentioned on the 15th inst. appeared on the 23rd. Eleven others were bred subsequently, and the remaining larvæ are hibernating.

Of two rather large broods of larvæ of *Acidalia emutaria*, from ova laid by females taken early in July, only six larvæ fed up; the first moth came out on the 24th, and the last not until Sept. 26th. The other larvæ are hibernating. I do not think that this is an easy species to get through the winter, as I have tried several times and have always failed; some kind of fungus attacks the larvæ. Another *L. favicolor* was bred on the 24th; in all I bred twenty-eight, the last one as late as Nov. 8th.

The 26th was fine and warm, with sun and cloud and a light westerly breeze. A female *P. napi* which was sent to me alive from the South of Ireland deposited about forty eggs upon a plant of black mustard, and I hope I may breed one or two of the dark *bryoniæ*-looking females next spring. As it was a very favourable evening for sugaring I went to the lanes and marshes, and, as I anticipated, moths swarmed, twenty to forty on each patch of sugar, the ground below being sprinkled with those that had fallen off. The most numerous were *pallens*, *c-nigrum*, and *xanthographa*—the two former very small examples, particularly the *pallens*, some of which are smaller than any I have ever seen. This seems to be the result of the hot dry summer, causing perhaps a shortage of food; the larvæ fed up more rapidly than usual, second broods appearing earlier this year than they generally do. Among the *pallens* were several of the red variety, some of them very bright. Other species seen or taken were *N. plecta*, *A. suffusa*, *A. segetum*, *G. libatrix*, *M. maura*, *C. nupta*, *A. tragopogonis*, *C. vetusta*, *P. meticulosa*, *T. pronuba*, *X. polyodon*, *H. micacea*, *H. paludis* (very much worn), and four of the red variety of *L. favicolor* (second brood).

The 28th was another favourable night for sugar, very warm and oppressive, with a little fine rain occasionally. Moths were in the greatest abundance; I have never seen anything like it before, the patches of sugar were quite hidden by them, and they kept fighting and pushing each other about, but they seemed to be rather light-shy and flew off in swarms directly the rays of the lamp were turned on them. It was also difficult to box any particular insect I wanted among the crowd, for as often as not when the box was held under it three or four undesirables would flop in at the same time. A great many were attracted to my light, and when I placed it on the ground while boxing an insect off a blade of grass, &c., dozens would come dashing against the glass. These were chiefly *Luperina testacea* and *Epineuronia popularis*. The swarms to-night consisted of the same species that I obtained on the 26th; the best were three *L. favicolor*, there might have been others, but among the crush it was difficult to distinguish them.

The 30th was a fine warm night. I went to the lanes and marshes again. There were scores of moths on the sugar, but nothing like the number there had been on the 28th. They were mostly the same species, with the addition of *Amathes* (*Orthosia*) *circellaris*, *Agrotis saucia*, and *Calamia lutosa*. It was rather early for the latter, but it had been out for some days, as its wings were rubbed and split.

The first day in September was fine, bright and hot. I went to a lucerne field in the morning, where I saw and caught two *Pyrameis cardui*—one very fine, the other damaged; these were, I suspect, immigrants, as was also *Plusia gamma*, of which I noticed a good number flying among the flowers—there were none about a day or two earlier. There were a lot of fresh *Vanessa urticæ* and *Chrysophanus phlæas* and another brood of *Acidalia incanaria.* I fancy there is a succession of broods of this little species in warm, dry summers.

On the 2nd I took three more *P. cardui* on flowers of sea-aster—two were good, the other torn. The larvæ of *Euclidia mi* were now full-grown on seeds of coarse grasses; they are sometimes easy to see when stretched out to their full length on a stem, but are best obtained by sweeping.

On the 3rd the larvæ of *C. phlæas* that hatched out on the 16th of last month were now spinning up. *Amathes litura* was bred.

On the 4th I sugared on the coast, where *Noctua xanthographa* was in such countless numbers it drove everything else off. The other species present were the same as noted on previous nights, with the addition of two *Agrotis vestigialis*, one of which is the smallest example of this species I have ever met with.

On the 5th I saw six, and netted five, *P. cardui*; also saw three *P. atalanta*, the first noticed this year. *C. phlæas* was out in large numbers.

The 6th was a bright hot day. I visited some lucerne fields. Saw three *P. cardui* and netted two, also two fresh *V. io.* This butterfly has been very scarce this year, though it swarmed last season. I noticed a small white *Noctua* flying among the lucerne flowers, and upon netting it found it was a very small *L. pallens.* From fleabane I beat a very small *Ebulea crocealis*, evidently one of a second brood.

On the 7th a large male *Sphinx convolvuli*, which had been taken in one of the machine shops at Parkeston, was brought to me, but it was too much damaged to be of any use. I saw three, and captured one *P. cardui* on the salterns on flowers of sea-aster, also one *P. atalanta*, a very worn specimen. *C. phlæas* was very numerous on the aster flowers; I always examine them carefully on the chance of a variety, and got a nice dark ab. *eleus.* [The female *Dasychira pudibunda* which I took on May 27th laid a lot of eggs; these I sleeved out in the wood on June 2nd, and upon examining the larvæ on June 27th found them very small, and brought about a dozen home. On July 31st I examined the sleeve again, and found the larvæ were still very small, and nearly all the leaves were eaten, so I brought them home, and they were still feeding on Sept. 7th—some nearly full-grown while others were small. How many times does this larva change its skin? they seem to be always doing it.] I visited the woods this evening; it was still and close with a bright moon and heavy dew and a slight ground fog in the valleys. A good many common species visited the sugar, also one *Acronycta rumicis*—a second or third brood, several *T. pronuba* and *L. pallens*, and a few *Hadena protea*.

8th.—A female *S. convolvuli* in a very rubbed condition was brought to me; it had been taken off some palings. I went to the marshes and reedy dykes at dusk. Moths were swarming on the reed-blossom, but it was rather hard to distinguish them, as there was a strong breeze and the reeds kept swaying to and fro. As far as I could make out, they were chiefly *Noctua xanthographa*, *N. c-nigrum*, and *L. pallens*, with an occasional *H. micacea*, *H. paludis*, and *A. suffusa*.

On the 12th another fine female *S. convolvuli* was brought to me. It had been taken off some washed clothes hanging up to dry in a backyard. I took a rather nice variety of *C. phlæas* with extra large blue marginal spots on hind wings. The larvæ of *Homœosoma senicionis*, or *binævella*, were now rather numerous spun up in flowers of ragwort; both species occur here.

On the 13th another *S. convolvuli* was brought in. It was taken resting on a coal-truck at Parkeston, and had been very roughly handled. One *Gortyna flavago*, one *Ennomos tiliaria*, and two *Tortrix podana* were taken at the electric lights, Parkeston; the latter must be a second brood.

The 15th was fine, sun and cloud, getting cooler. I saw several *T. podana* in our garden amongst *Euonymus* bushes, also many fresh *Pararge megæra* on an old railway-bank—these must have been a partial third brood. I had seen several *A. incanaria*.

On the 17th the first *C. phlæas* was bred from ova laid by the female taken the beginning of August; about fifty were bred from this brood, the last appearing on October 10th, and there was not a decent variety among them. *Macroglossa stellatarum* was seen in our garden. This is a rare moth here, and I have not met with one for some years. Its favourite food-plant, *Galium verum*, does not occur here.

The 19th was fine and bright and warmer. I went to the woods to look for larvæ among young aspens, but there were hardly any to be seen; I only found one *Notodonta ziczac*, one *Dasychira pudibunda*, and one *Nephopteryx hostilis*, and scarcely any larvæ are to be obtained by beating. I had a great surprise, namely, at seeing six or seven fresh *Limenitis sibylla*. (An account of this appeared in the 'Entomologist' for October last, p. 327.)

The 20th was rather overcast and cool. I tried sugar in the evening; there were very few moths, but I noticed *Amathes pistacina* for the first time, and several of a second brood of *Agrotis puta*.

The 23rd was fine and bright in the morning, but clouded over during the afternoon, and rain set in at 10 p.m. At the end of July I had obtained a batch of ova of *A. emarginata*, of which the larvæ fed up well upon knotgrass, and the first moths, four in number, emerged to-day. (About forty were bred altogether, the last appearing on October 17th. None of the larvæ attempted to hibernate.) Larvæ of *Eupithecia assimilata* were now numerous on wild hop, also a few small *P. chrysitis*. I tried sugar in lanes and marshes, and obtained several *A. pistacina*, *A. lunosa*, *A. litura*, *Calocampa exoleta*, also seven *Calamia lutosa* at rest on reeds, but the rain drove me home.

The 25th was fine, bright, and warmer. A good many *Pararge megæra*, *C. phlæas*, and *L. icarus* were still about. The two latter were most abundant this autumn. I went to the woods in the evening. A good many moths visited my sugar—*A. rufina*, fine and very fresh, *A. pistacina*, *A. lunosa*, *L. pallens*, *X. cerago*, *T. orbona*, *A. suffusa*, &c.

The 27th was a warm dark night, with moderate westerly wind. I sugared in lanes and marshes. Moths were rather plentiful. *C. lutosa* were swaying to and fro on the reed-blossom in some numbers, but were mostly worn. On the sugar, in addition to plenty of *A. pistacina*, *A. puta*, &c., were four worn *C. nupta*, and one each of *B. rhomboidaria* and *H. proboscidalis*. It was rather late in the year for these.

(To be continued.)

THE SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY, OXFORD, AUGUST, 1912.*

By H. Rowland-Brown, M.A., F.E.S.

The Second International Congress of Entomology follows the inaugural Congress held two years since at Brussels. In the ordinary course of events, it was intended to make the reunion triennial. In 1910, however, it was expected that the British Association would proceed to Australia in 1913, and as many entomologists had announced their intention of going with them, it was decided to anticipate events. Yet, although no more than two years have passed since the last meeting, the attendance at Oxford is striking proof of the keen interest taken by scientists in entomology, though the actual number of members subscribing is lower than it was on the previous occasion.

Not far short of two hundred took part in the session, which lasted from Monday, August 5th, to Friday, the 9th, for the list published at the beginning of the week was supplemented by many who found it convenient to attend only on certain days. It is, however, a matter for regret that the British Field Natural-

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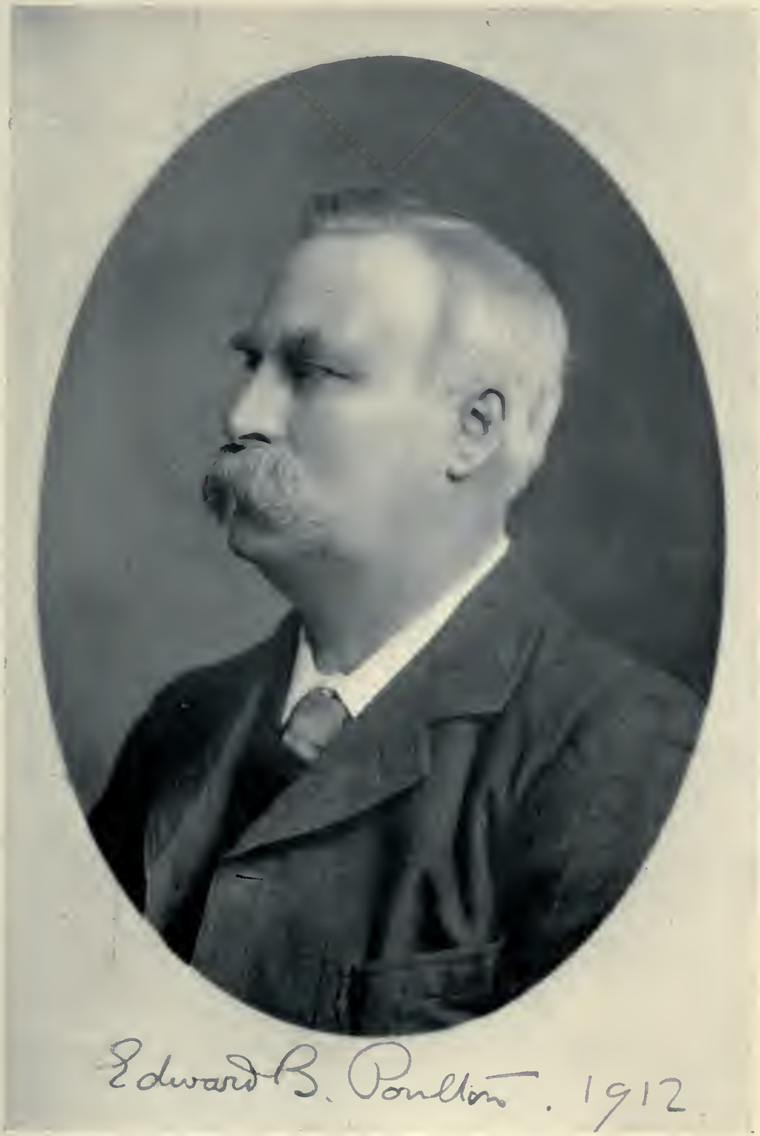
* A part of this notice appeared in the 'Times' of Monday, August 12th, under the heading "Congress of Entomology—a Retrospect."—H. R.-B.

PRESIDENT OF THE SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY, OXFORD, 1912.



Edward B. Poulton. 1912

EDWARD BAGNALL POULTON,

D.SC., M.A., F.R.S., F.E.S., ETC.

Hope Professor of Zoology in the University of Oxford. President of the Entomological Society of London 1903–4. President of the Linnean Society 1912.

ist Societies did not take up the Congress with more zest; and there were absent quite a number of ardent workers who would have been a welcome addition to the forces. On the other hand, the international element was well sustained; the United States leading the way with eighteen members, Germany following with thirteen, Belgium with nine, while I think the only European States of the west and north unrepresented were Italy, Portugal, Russia, and Norway. Against this it is gratifying to note that the remoter countries—Turkey (2), Spain (4), and Egypt (1)—all sent delegates, and Dr. R. C. L. Perkins, of the Sandwich Islands, and Professor Carlos E. Porter, of Chile, may be congratulated on having come from "the uttermost parts of the earth."

Proceedings opened in the beautiful hall of New College on Sunday evening (4th) with an informal gathering to meet the President, Professor E. B. Poulton, F.R.S., and then the charming badges designed by Professor Selwyn Image, Slade Professor of Art, were distributed to members, and the various orders of the day circulated. The badge consisted of a circular gilt brooch, with the arms of the University, our hosts, in blue enamel, and the legend "Congr: Entomol: Internat: Oxon: 1912." This served as a pass throughout the week to all the meetings and festivities. And here I may be permitted to offer a word of grateful thanks to those who were responsible for the organization of the Congress, the indefatigable Secretaries, Mr. H. Eltringham (whose exhibition of Acræines was one of the *clous* of the Museum*) and Mr. G. H. Grosvenor, who stepped into the breach when Dr. Malcolm Burr was unavoidably prevented from completing his work, and attending the first days; Professor Poulton and Dr. F. A. Dixey, who invented the delightful *café* in the gardens of Wadham College—where members lunched, teaed, and met after dinner under shelter of Mr. Moon's large marquee—and made the arrangements for the final banquet when the Christ Church rendezvous was perforce abandoned. A hundred and forty members and guests were present in Wadham College Hall on this occasion—the college which is actually the cradle of the Royal Society, where the original F.R.S. assembled under Warden Wilkins (1648–59),† and where for the first time in history a lady replied to the toast of "The Ladies." Meanwhile, the great majority of members were housed for the week in the several colleges of Wadham, New, Merton, and Magdalen, and our foreign friends were thus initiated into the mysteries of the Oxford breakfast and "bedder," and given an opportunity to inspect the matchless silver treasured within these ancient "homes of peace." Among eminent lepidopterists may be mentioned M. Charles Oberthür, of Rennes, paying a first visit to England, and Professor D. A. Seitz, of Darmstadt; of other branches, Dr. A. Handlirsch (Vienna), Professor A. Lameere (Brussels), President in 1910, Dr. E. Olivier (Moulins), Professor H. J. Kolbe (Berlin), Professor Dr. J. F. Van Bemmelen (Groningen), Dr. G. Horvath (Budapest), Father Lunginos Navas (Barcelona), Professor Y. Sjöstedt (Stockholm), of Kilimanjaro fame; and a fully representative body of workers from America, including Professor J. H. Comstock (Ithaca), Dr. L. O. Howard (Washington), Professor V. L. Kellogg (Stanford University), Dr. H. Skinner (Philadelphia), and Professor W. M. Wheeler (Harvard); economic entomology in the Canadian Commonwealth being safe in the hands of Dr. C. Gordon Hewitt (Ottawa) and Mr. H. H. Lyman (Montreal).

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* A grand collection of Acræinæ, models for the figures of Mr. Eltringham's "Monograph of the African Species of the Genus *Achræa*, Fab., with a supplement on those of the Oriental Region," Trans. Ent. Soc. Lond., Part 1, July 12th, 1912. Dr. Dixey also exhibited an equally comprehensive series of Pierinæ.

† See 'The Early Connexion of the Royal Society with Wadham College and the University of Oxford,' by F. A. D. Oxford, 1912.

Presidential Address.

The Presidential Address was delivered on Monday morning, Professor Poulton laying special stress on the claim of the Oxford University Museum as a place of meeting. For it was under this same roof that the early struggles between the "Darwinians" and the older schools of thought took place; that Ruskin preached the doctrines of natural beauty; and that from early beginnings in 1849 the Hope Department under Westwood took form and shape as leader and teacher in the world of entomological discovery and thought.

By means of numerous examples he then traced the evolution of the female butterfly *Papilio dardanus* from Madagascar across the continent of Africa. In the island the female closely approaches the male in the coloration and markings of the wings. But on the continent at the Rift Valley escarpment, British East Africa, and in its westward localities it assumes a variety of forms corresponding with the several distasteful species of other genera found or known to exist in these localities. Thus on the north-east and north-west Nyanza the males are still unchanged in appearance, yet the female butterfly exhibits wings of several patterns. But while the males retain their ancestral coloration, the females mimic various Danaine species. In Nigeria the female occurs principally in a black and white form (=*hippocoon*), mimicking the dominant black and white Danaine of that region. Eastward again from the Rift Valley escarpment, from Mombasa into German East Africa, the usual models are of the Danaine group, though one form of the female (=*planimoides*) has developed the pattern of a member of the Acræine genus *Planema*, and in South-east Rhodesia the black and white (*hippocoon*) form predominates, and the butterfly is found to fly together with the black and white species of other groups. At Durban three forms of the female (*hippocoon*, *trophonius*, and *cenia*) occur, and all of them have been bred from eggs laid by the same parent, together with a fourth form (*leighi*), named after the discoverer, the late Mr. Leigh.

Other papers upon evolution, bionomics, and mimicry, and bearing on the subject of evolutionary processes as observed in insects were contributed by the President, who gave an account of Mr. C. A. Wiggin's and Dr. G. H. Carpenter's researches in mimicry in the forest butterflies of Uganda; by the Rev. K. St. A. Rogers; and by Mr. R. C. L. Perkins, who described and compared the colour-groups of Hawaiian *Odynerus* (wasps) found on the two neighbouring islands, Oahu and Kauai. In the section of philosophic entomology Professor J. F. Van Bemmelen (Netherlands) explained the phylogenetic significance of the development of the butterfly wing, illustrating the development of the colour pattern in the pupal and imaginal phases, and showing how by the ancestral pattern, traced in this way, species widely differing in appearance may be identified and classified as members of the same family.

DISTRIBUTION.

Several important papers were read on the subject of insect distribution, and the assistance rendered to science, especially to palæontology, by a closer knowledge of the subject. Professor Kolbe explained "Die Differenzierung der zoogeographischen Elemente der Kontinente," showing how the elements of the existing insect fauna of Europe consist of circumpolar groups, relics of ancient geological periods, and lately arrived groups from Western and Central Asia and the tropics: the same process being observable in North America, where, as in the Old World also, over the southern continents are to be found elements of the northern, of the tropical zone and of the antarctic continents. Dr. Handlirsch dwelt on the relations between palæontology, phylogeny, and "animal geography," and attempted the solution of several interesting problems by statistical methods, demonstrating thereby that many of the hypothetical "land bridges" lately constructed between Africa, America, and Australia will not stand scientific criticism on these lines. While Dr. P. Speiser insisted on the importance of determining how far their presence might be due to human agency in fixing the antiquity of species in a given locality.

ECONOMIC AND PATHOLOGICAL.

In none of the Sections was greater interest shown than in the Economic and Pathological, where methods of combating insects destructive to agriculture and forest were dealt with by many delegates appointed by our Colonial and by foreign Governments. The paper read by Sir Daniel Morris on behalf of Mr. W. A. Ballou (Imperial Department of Agriculture), "Some Entomological Problems in the West Indies," demonstrates beyond dispute how an intimate knowledge of the life-histories of insects may be put to practical uses, and how by the introduction of the natural parasite of an immigrant pest the attacks of the pest may be controlled and even defeated altogether. For example, in the sugar-canes of Barbados a root-boring weevil, *Diaprepes abbreviatus*, has become a pest; in St. Kitts termites, *? Termes flavipes*, have attacked the ripening stalk; in Barbados the red maggot, *Perrycondyla gossypii*, in Antigua the flower-bud maggot, *Contarinia gossypii*, and in all the cotton islands except Barbados the leaf-blister mite, *Eriophyes gossypii*, have done great injury to the growing plants, but by the destruction of old plants at the end of the season, and picking off and destroying infested leaves, a satisfactory crop has been ensured. Yet the control of some of these pests by their natural enemies has proved even more effective. In Barbados black-scale, which wrought widespread havoc, is now completely controlled thereby. By the use of the shield-scale fungus the scale insects, which are accompanied by the black blight, have been much reduced. In St. Vincent the cotton worm, *Alabama argillacea*, has been subjected successfully to several predacious insects, especially the "Jack Spaniard," *Polistes annularis*.

The question of international action to check generally the importation of pests was raised in the discussion of Mr. A. G. L. Rogers's paper on "The Necessary Investigation with relation to Insect and Fungus Enemies of Plants, Preliminary to Legislation." Mr. Rogers pleaded for the consideration and establishment of principles upon which such action might be made feasible. So far, he said, regulations of the kind, while hampering international trade, had in no case been successful in preventing the introduction of disease, the truth being that the pest had anticipated the law. But the real cause of the failure is due to ignorance of the conditions under which the pests spread rapidly enough to become a serious danger, and of their distribution throughout the world; experience proving it impossible to foretell which species will fail to establish themselves, and *vice versa*. Thus, although the potato moth is harmless in Italy, it became a pest when introduced into India; while several Continental pests have failed to establish themselves in England. A close study of the pest in the mass, and of the aggregate injury caused by a congregation of destructive insects in their *maximum* intensity, would prove the most useful, and each country should be invited to compile a black list of those present in sufficient numbers to be characterized as epidemic; to prepare maps of areas infected, and to communicate these, with the records, to all Governments interested. Mr. Rogers's practical suggestions were accepted and endorsed by the Congress, which at a later stage unanimously resolved to support cordially the proposed formation by the International Institute of Agriculture at Rome of an International Commission to deal with these problems, as the best means to secure the greatest amount of protection with the least injury to international trade in natural products.

As a further practical demonstration of the place of bionomics—the study of life-history—in economic entomology, a paper on "Aphides Attacking Cultivated Peas" may be mentioned. Professor F. V. Theobald declares that he has failed to find in this country a single instance of pest control by natural enemies, and regards birds as our most valuable allies, even the much-abused sparrow coming in for special tribute as a greedy consumer of green-fly, in company with such insectivorous species as the whitethroats and smaller tits. He had discovered, however, that the suspected pea-pests of the genus *Macrosiphum* contained more species than was supposed, some of which were harmless to the plants in question, while a study of the life-history of the destructive green-pea aphis revealed the fact that its earlier phases are passed upon clover. In Canada this aphis is also very injurious, but, as Dr. Gordon Hewitt pointed out, the conditions there appear to be different, and it is usually controlled by a small Braconid parasite. On the subject of locust destruction, Mr. J. Jablonowski (Budapest) presented an extremely instructive series of lantern-slide pictures to illustrate the methods employed by the Hungarian Government to combat the ravages of the species known as *Stauronotus maroccanus*, showing the systematic division of infected areas within canvas screens, the way in which the insects were driven towards them, and how, when they attempted to surmount the fences, they were destroyed and burned. He said that by means of the apparatus employed the total cost of the operations had been reduced from something approaching three million krone to about 270,000 krone, contrasting more than favourably with that incurred by the British Government in Cyprus under similar conditions.

In the pathological department Dr. Stephen A. Forbes (U.S.A.) contributed a valuable series of observations on "*Simulium* and Pellagra in Illinois, U.S.A." We are accustomed to associate this terrible human scourge in Europe with rural Italy, and hitherto the transmission of the disease germs has been attributed to the agency of a species of sand-fly, breeding in streams and running water, but never, like the mosquito, in stagnant pools. Dr. Forbes, however, has failed to associate directly the many cases of pelagra investigated in his State with insects of this genus, and at present, therefore, the case against *Simulium* must be regarded as not "proven."

NOMENCLATURE.

In the present state of chaos and conflicting opinions upon the subject of nomenclature it is gratifying to note that the Congress has indicated a system and rules which may lead to finality. All entomologists are agreed that the time is ripe for action. The difficulty hitherto has been the adoption of methods calculated to bring about the desired end. Those who heard M. Charles Oberthür's eloquent appeal, "Pas de bonne figure à l'appui d'une description, pas de nom valable," cannot fail to have been struck at once by the sincerity of the speaker and the splendour of his ideas. But British entomologists cannot accept the proposition, even when M. Oberthür is prepared to concede a photograph instead of a coloured figure, and though, in parliamentary phrase, the motion was not pressed to a division, the feeling of the Congress was obviously in favour of "words" as opposed to "pictures," and the arguments brought forward in Mr. L. B. Prout's paper "On the Place of Figures in Descriptive Entomology." In the end, therefore, the resolutions sent up by the Entomological Society of London were adopted in principle, and it was decided to institute an International Committee to deal with the subject of entomological nomenclature. The Congress also advised the formation of national committees in each country, to be elected by the various entomological societies, to collect opinions and consider changes required in the International Code; and further commissioned the International Committee to communicate their resolutions to the International Committee on Zoological Nomenclature.

OTHER PAPERS.

I regret that in the space at my disposal I can do no more than mention the titles of some of the other papers read. They include the fascinating study by Professor J. H. Comstock, "The Silk of Spiders, and its Uses"; "Scent Organs in the Lepidoptera," Dr. F. A. Dixey, M.D., F.R.S.; "Sex Limited Inheritance in Insects," Professor L. Doncaster; "On the Viviparity of Polyctenidæ," Dr. K. Jordan; "On the Founding of Colonies by Ants," Mr. H. St. J. Donisthorpe and Mr. W. C. Crawley; "How does the Insect See the World?" Dr. Adalbert Seitz; Professor Kellogg's suggestive researches on "Distribution and Species-forming among Ectoparasites"; and Mr. S. A. Neave's vivid *résumé* of his "Travels as an Entomologist in Eastern Africa."

NATIONAL RESERVES.

Nor must I omit to mention, among the less technical subjects brought before the Congress, that none met with a more sympathetic reception than the Hon. N. C. Rothschild's plea for the institution of National Reserves throughout the United Kingdom in suitable localities, wherein the insect fauna and flora of these islands may be preserved for the common enjoyment of the student and the general public. A "Society for the Promotion of National Reserves" has been formed, and will presently publish its "prospectus." In the United States vast territories have been allowed to remain in a state of primitive nature; in Sweden, latterly, the Government has "enclosed" certain threatened areas of Lapland; and in Hungary official permits are required of collectors in favourite localities. Years ago Oxford led the way with the "Ruskin Plot," while a portion of Wicken Fen has already been reserved to the nation for ever.

SOCIAL.

Lastly, despite the rain of surely the wettest August on record, the excursions arranged for Wednesday afternoon were both extremely successful, large parties enjoying the welcome accorded them by the Secretary of State for the Colonies, Mr. L. Vernon Harcourt, M.P., in his lovely Nuneham House; and the picnic in Bagley Wood, at the invitation of the President and Fellows of St. John's College; while we shall not soon forget the concluding entertainment of the entire Congress at luncheon, and in the Museum at Tring, by the Hon. Walter Rothschild, F.R.S., to whose support, coupled with that of the "Carnot" of our organization, Dr. K. Jordan, we owe it largely that the International Congress of Entomology is established and permanent. Meanwhile, the next meeting is fixed to take place at Vienna in 1915, under the presidency of Dr. A. Handlirsch.

BY THE WAY.

WESTWOOD is, and will ever be, a name to conjure with among us, for never again can an individual possess so complete a grasp of the whole gamut of entomological lore. He was "a man of culture and intelligence and a distinguished entomologist," as says the current 'Strand Magazine'; yet "he never succeeded in pronouncing the letter 'h.'" He once asked his friend Mansel who was St. Bee? Remembering his peculiarity, Mansel replied that he was a near kinsman of St. 'Ives. At an electoral contest between Mr. Gladstone and Mr. Hardy, Westwood, coming in late, hurried and breathless, announced his vote for "Glad—no, no—I mean 'Ardy." Henry Smith claimed the vote for Gladstone. "Why," said the Vice-Chancellor, "he only pronounced the first syllable of Mr. Gladstone's name." "Yes, sir; but he did not pronounce the first letter of Mr. Hardy's." The same Magazine has an interesting article on "The Lore and Legend of Japanese Fire-Flies," and their "Hunting Song":—

> "Hotaru koi, Hotaru koi,
> Ando no hikari wo choito mite koi."

reminds one of our "Lady-bird, Lady-bird, fly away home." These naturally become Golden-bugs in the land of the almighty dollar.

A newspaper notice just the other day informed all and sundry that "The State of California has recently discovered the great value of the ladybird as a destroyer of the plant-lice that kill the fruit buds": William Kirby discovered the same thing—about 1820. The State wanted quantities, and their collectors could find "cast-off shells" (presumably of pupæ) only. But, on returning to the shells in the winter, they came across "a peculiar snowball, with a nucleus of twigs and pine-needles. The ball was broken open, and inside was found a squirming mass of ladybirds. Four hundred pounds of ladybirds were dug up in one day from under the snow and sent to Sacramento." Whether the ball was made by Coccinellæ or Aphides is not stated, but we should suspect the former to have rather devoured the latter than that they themselves be a gall-making species, and to have a penchant for a common prey rather than true gregariousness.

Lincolnshire is an extremely neglected county entomologically, and we have never met anyone who had collected aught but Lepidoptera there. So we took a rush through it last June to see its possibilities. Approaching from the south we slept at Spalding and Boston, both considerable towns in the lap of very thoroughly drained fens; these fens stretch through the eastern half of the county, and have been cultivated so long that we failed to find in them a single fen, or uncommon, insect; to the north-east Boston has some common agricultural country. The fens dogged us through Wainfleet to Skegness, a modern seaside resort with nothing to appeal to us but the sandhills and a little heathy ground extending some five miles south, covered with *Hippophæ rhamnoides*, with its peculiar *Psylla*; the sand here is very pale, and the Diptera frequenting it decidedly paler than the same species are at Deal. At Mablethorpe we met the same sand, though the height of the Roman sea-wall sheltered additional insects. Two nights we stayed at Louth, a delightful old-world town surrounded by charming country, of which the

Elkington Woods afforded capital collecting. Thence a run to see the Grimsby shipping was hurriedly followed by a *volte-face* to Market Rasen, a small market-town with the usual midland complement of wood and lane collecting: the day was fine and insects abundant. At Lincoln it poured torrentially. But we thought eighteen hundred specimens not a bad week's bag, though many were common kinds.

C. M.

NOTES AND OBSERVATIONS.

Note on Stephens's Culicidæ.—Since writing my notes on the British mosquitos I have been surprised to discover that Stephens's collection of Culicidæ is not only still in existence, but the specimens are still in a fair state of preservation in the British Museum. Of the species Stephens described himself, *C. affinis* is represented by six male *Theobaldia annulata*; *C. fumipennis* by one female *Theobaldia theobaldi*; *C. marginalis* by one male and one female *C. pipiens*; and *C. concinnus* by one female *O. nemorosus* (?). The dark margins of the abdominal segments referred to by Stephens in *C. marginalis* are the posterior borders, not the lateral ones, as might be inferred from the description; the colour is on the integument and is not due to scales: such a condition occurs not uncommonly in female *C. pipiens*, but there are no structural differences. The specimen of *C. concinnus* was not so labelled, but answers perfectly to Stephens's figure; it is just possible it may eventually prove distinct from *O. nemorosus*, but I prefer at present to leave it as a synonym or variety of Meigen's species. The name *Theobaldia fumipennis* (Steph.) will have to replace *T. theobaldi* (Meij.). Of the remaining specimens in the collection, those named *sylvaticus*, *lutescens*, *punctatus*, *rufus*, and *bicolor* are all more or less rubbed *C. pipiens*. *C. ornatus* is represented by one female *O. lateralis* and one male *O. diversus*; *C. flavirostris* by one female *C. pipiens* and one male *A. maculipennis*.—F. W. Edwards; British Museum (Natural History).

Egg of Eustroma reticulata.—Having recently had an opportunity of observing the ova of *Eustroma reticulata* deposited under natural conditions, a brief description of the egg may be of interest to complete my previous notes on the life-history of this species (*vide* 'Entomologist,' March, 1912, p. 85). Size, large for the size of the moth; shape, a blunt oval; colour, pearly white, decidedly opalescent; surface, smooth, and, under moderate magnification, without "pitting" or pattern; attached to the under side of the balsam-leaf in apparently no precise situation; rarely more than one egg on a leaf.—Frank Littlewood; 10, Aynam Road, Kendal, Westmorland, August 7th, 1912.

Argynnis euphrosyne, ab.—A short time since my friend Mr. C. J. Bellamy showed me a variety of the above-named butterfly he had been fortunate in capturing in the New Forest this season. The usual tawny-brown ground colour of the wings is replaced by a pale creamy tint, which gives the specimen a semi-transparent appearance, and consequently the usual black spots and bars—which appear to be normal—show up conspicuously, and the dark blotches at the base of the wings are very obvious. At the anal angle of hind wings there is a shaded indication of the usual tawny hue. The specimen is apparently a male in very fair condition, although I should imagine when seen on the wing it might have been mistaken for a very worn specimen.—G. B. CORBIN; Ringwood.

COLIAS EDUSA, PYRAMEIS CARDUI, AND P. ATALANTA IN THE ISLE OF WIGHT.—The weather of late has been most unfavourable with us for entomology. The early part of the season was good for *C. edusa*, *P. cardui*, and *P. atalanta*. I bred the two former from ova, and of the latter larvæ were found in plenty on nettle. I took females of *P. cardui* in March which deposited ova, from which fine specimens were reared in May and June. I obtained ova of *C. edusa* in May, and had a very fine series from these. I now have another family of *C. edusa* feeding up in my greenhouse. I am afraid that this species has fared badly in the open, as we have had ground frost and continuous rains.—G. NOBBS; North Lodge, East Cowes, Isle of Wight, August 17th, 1912.

COLIAS EDUSA IN WILTSHIRE.—A fine male specimen of this butterfly was captured near Fordingbridge on August 5th, 1912.—A. S. CORBET; Bournemouth.

CAPTURE OF PONTIA DAPLIDICE IN NORFOLK.—On Wednesday morning, July 17th, I captured a specimen of *Pontia daplidice* near Norwich; it was a female, and in good condition. The 17th was warm and sunny, with rather a strong north-easterly wind, which had been blowing, more or less, for the two previous days, and common butterflies were plentiful on the sheltered flowery railway-bank, along which I happened to be walking, luckily, however, with a net. The *daplidice* was amongst a good many *Pieris rapæ*, flying very sluggishly and feebly from flower to flower, eventually settling on a plant of knapweed, from which I caught it. A month previously I had been watching the strong swiftly-flying *daplidice* in Hungary, but the climate of Hungary is not that of Norfolk, and doubtless this specimen was more or less torpid and chilled by the cold of the early morning. I am glad to say that this record is an addition to the Norfolk list of butterflies, as *P. daplidice* has not previously been taken in the county, though it is reported to have been captured at Felixstowe and near Aldeburgh, in Suffolk.—GERARD H. GURNEY; Keswick Hall, Norwich.

PHRYXUS (DEILEPHILA) LIVORNICA.—A specimen of *Phryxus livornica* was taken at dusk at rhododendrons in a garden at Parkstone, Dorset, on May 19th last.—CYRIL ADAMS; Penn Hall, Parkstone.

DEILEPHILA GALII IN INVERNESS-SHIRE.—I took a very large and beautiful female example of this species at dusk here on the 24th instant, as it was hovering before some honeysuckle.—GERVASE F. MATHEW; Gairlochy, Spean Bridge, N.B., July 29th, 1912.

LITHOSIA LUTARELLA (PYGMÆOLA) AND CRAMBUS FASCELINELLUS IN NORFOLK.—When collecting on the Norfolk coast with the Rev. J. E. Tarbat, I noticed a small moth fall from a spike of marram grass on to the sand. My surprise and delight were great when on boxing the insect I found it to be a fine male *lutarella*. A subsequent visit at night to the same spot showed that the moth was there in some plenty, over a score of specimens being taken. A new locality for this local little moth seems worth recording, as hitherto it has, I believe, only been taken at Deal. In the same district we also took a fine series of *Crambus fascelinellus*. The capture of the first example was rather by way of a lucky chance, as it was disturbed from an overhanging sand-hill, which we subsequently found was not its usual haunt in the day-time. Later we discovered that the moth sits by day in the small sand-pits and cart-tracks on the more settled parts at the back of the sand-hills. By sweeping the net over the sand the insect could be induced to fly if the sun was shining. Each rose to settle again a few yards off, where it was easily captured. A few were taken on the wing at night, but nearly the whole of a long series was taken in the above manner.—JOHN W. METCALFE; Ottery St. Mary, August, 1912.

DIPTERYGIA SCABRIUSCULA IN HYDE PARK.—I caught in Hyde Park, on July 25th, an example of *Dipterygia scabriuscula*. Is this species of regular occurrence in London?—N. C. ROTHSCHILD; Arundel House, Kensington Palace Gardens, W.

METROCAMPA MARGARITARIA AND THYATIRA BATIS IN ISLE OF SKYE.—In your 'Moths of the British Isles' (ser. ii. p. 270) you except the Hebrides from the distribution of the light emerald (*Metrocampa margaritaria*). Perhaps it may interest you and your readers to know that this moth has been exceedingly plentiful this year (I cannot speak for earlier ones) at Kyleakin, Isle of Skye. It is true we are here very near the mainland of Ross-shire, or perhaps your reservation refers only to the Outer Hebrides.* I have also lately captured three fine specimens of *Thyatira batis* at sugar in a small wood round the house.—(Rev.) ARTHUR S. HOOLE; Kyle House, Kyleakin, Isle of Skye, July 25th, 1912.

COLLECTING IN WESTMORLAND, 1911.—*Argynnis adippe* seemed to be just beginning on July 23rd, although one of the three specimens caught had evidently been flying for some days. Males of *Epinephele ianira* were plentiful, and three females were noted. Reed flowers, on the 6th, on some low-lying marshy ground, produced *Leucania impura*, *Plusia festucæ*, *P. arenosa*, *Coremia munitata*, and *Cœnocalpe vittata*. On the 9th, a very hot day, *Aphantopus hyperanthus* was present in limited numbers in its restricted haunt. Several var. *arete* and one good example of var. *obsoleta* were taken. Dusking on the 13th yielded *Lygris populata*, *Cidaria pyraliata*, *C. fulvata*, *Acidalia aversata*, *A. bisetata*, and *P. flavofasciata*. *Ortholitha limitata* appeared on the

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* Yes, the outer group of isles was intended. *M. margaritaria* has been previously recorded from the Isle of Skye.—R. S.

16th, together with second brood examples of *P. napi* and *Chiasmia clathrata*. A female *Geometra papilionaria* netted at 10 p.m. on the 18th gave me thirty-nine eggs, four of them laid on the under side of a birch leaf, the remainder on the muslin cover of the flower-pot in which she was confined. A visit to the "moss" on the 23rd found *C. imbutata* (male) common, and with neither sun nor wind, easy to net. Rain came on, but still they "lifted" freely; the reverse being the case with *Selidosoma ericetaria*, which seems to like the sunshine, and is sluggish and difficult to move in dull weather. *L. ægon* was common, but looking *passé*. Some of the females are nicely splashed with blue.

On the 30th some twenty newly emerged *P. brassicæ* were noted feeding on knapweed flowers on the roadside, and on the 31st *Cilix spinula* was netted freely in the neighbourhood of blackthorn, and about a dozen *Anartis plagiata* flying at dusk over a small patch of St. John's Wort. Eggs of the latter hatched on August 16th, and the larvæ fed as long as the leaves remained, and are now sitting motionless on the dead stems. The same night found imagines of *Stilbia anomala* plentiful, but rather the worse for wear, on isolated patches of ragwort growing amongst the loose stones of the bare limestone fell. The sexes were about equally common. Though by no means shy of the lamplight, this moth is a difficult one to box off the flower head. If the flower is, by one's clumsiness, jarred or shaken the males usually fly and may be netted, but the females either drop to the ground or dive into the flower head. We found it a good plan to gently touch the ragwort stem with the rim of the net, and catch them as they either flew or fell. It is a restless insect in the pillbox, and should be killed immediately. The species seemed to be peculiarly local; an equally attractive looking group of ragwort heads at the other side of the wall failed to yield a single specimen, and the same thing was noticed on succeeding nights. In addition, the ragwort produced *Agrotis lucernea*, *N. umbrosa*, *T. pronuba*, *A. oculea*, *G. obscurata*, *L. olivata*, *C. truncata*, *C. bilineata*, *C. unidentaria*, and a number of "pugs."

Heather bloom was not very productive, for during August the extreme heat of the summer day was followed frequently by a distinctly chilly night. The only captures were *Noctua xanthographa*, *N. castanea*, *A. agathina* (four), *N. glareosa*, *N. dahlii* (one), *C. graminis*, *C. salidaginis* (three), numerous *C. testata*, and *O. filigrammaria* (three) (Sept. 1st).

Up to 9 a.m. on August 13th *Vanessa io* could be taken freely, feeding on the flowers of hemp agrimony, but after that hour they apparently found some other occupation. The same morning I netted a freshly emerged male *Gonepteryx rhamni*. This species, formerly considered one of our "common" butterflies, is getting scarcer each year. *Tapinostola fulva* was out in good time this season, four fresh males being taken on August 14th. Mr. Mallinson reported *Charæas graminis* and *Epineuronia popularis* abundant at the Windermere lamps, accompanied by second brood examples of *L. camelina*, *N. ziczac*, and *P. dictæoides*. Sugar, which had been unprofitable all the summer, now began to look more hopeful. Our first essay, on

September 4th, produced one *Amathes litura*, one *T. pronuba*, one *Amphipyra tragopogonis*, and one beautifully fresh *E. nigra*—a sample lot, but enlivened by the presence of the last-named species. A second attempt on the 6th added another *E. nigra*, one fresh *M. brassicæ* (second brood), and one *A. ypsilon*. Subsequent systematic sugaring throughout the month was rewarded by the capture of a fine series of *E. nigra* in bred condition; about a dozen *A. ypsilon*, an abundance of *A. aprilina*, *E. satellitia*, *A. litura*, *A. helvola*, *C. lignea*, *C. vaccinii*, *A. circellaris*, *A. macilenta*, *M. oxyacanthæ*, and var. *capucina* (some very dark); a few *H. protea*, *A. lota*, *C. quadripunctata*; three *A. segetum*, one *A. exclamationis*, one *P. chi*, one *N. c-nigrum*, and one *H. nictitans*. Two specimens of *C. vetusta*, and about a dozen *C. exoleta* were added in early October. *Agriopis aprilina* varies considerably in the distribution of the black on the fore wings—some are very dark and striking. An interesting peculiarity of this species appears in the extreme and permanent rigidity of the joints of the fore legs after death (pricked with oxalic acid), making it a matter of considerable difficulty to extend and set these limbs. The muscular development of the femora is abnormal, but I have looked in vain for the reason. Other insects killed in the same way were not affected. Among hundreds of *Conistra vaccinii* I was lucky to find two good examples of the var. *suffusa* (Tutt), a form I do not remember noticing before. Autumnal sugaring presents some difficulties, the chief being (perhaps) the necessity of completing one's round well before dusk. All the moths come in the first hour or so, and after that may be looked for, not on the patches, but round the back of the tree and higher up on the branches. We frequently saw them later in the night as high as 12 ft. from the ground.

The conditions that go to make a good night are still a mystery; a bright moon and cold north wind were not invariably found to be detrimental to success, but the slightest touch of frost in the air was fatal, and put an end to the flight. At this time of year, however, it is possible to work in a couple of rounds and make a repectable catch in the early part of the night before the frost air is felt. Moths seem to anticipate an approaching storm, and an apparently ideal night, precursory to a change in the weather, will prove unproductive. The entomologist is not the only one to take toll of the visitors to "sugar." Night after night bats could be seen circling the baited trees, and several toads were observed actually standing on their hind legs beneath the patches with an air of blissful expectancy that was truly ludicrous. *O. dilutata* appeared on October 3rd, and was flying commonly by the 16th, when several nice melanic females were taken.—Frank Littlewood; 10, Aynam Road, Kendal.

Butterfly Collecting in Sicily and Calabria in 1911.—The first week in May was very disappointing. My records are: May 1st (Labour festa) dull and showery, with occasional slight glimpses of rain; the following day (May 2nd) began: "morning bright and sunny, spring butterflies out, fine fresh specimens including *cyllarus* and *rubi*," and ended, "wet afternoon and evening." The rest of the week was dull and cloudy, interspersed with showers and heavy rain.

The second week in May proved little better; I decided to make a tour to Southern Sicily, and took train to Licata, the port famous for the export of sulphur, which faces Africa. I had visions of African "migrants." The further south I got the country became more barren, more rocky, and more uninviting. Licata is a non-sanitary, dirty town, and especially dispiriting when a drizzling rain persists in falling. Next day I decided to proceed, or rather to return home, by a different route, and took the train. Here the people are so poor that the trains run at half the fares charged north of Syracuse and on the mainland, so travelling is cheap, and it is unnecessary to add slow, as the gradients are very steep. I booked to Ragusa, a town of 20,000 inhabitants, and the line runs through a rocky, treeless district, where miles and miles of thick stone walls enclose small patches of rocky ground, and where a little vegetation struggles through, but I saw no cattle in the fields. Ragusa is built on each side of a torrent bed, and is surrounded by a rocky district where asphalte is obtained. I could find no decent place to sleep at, and was recommended to take the last train on to Modica, with 40,000 inhabitants, and where there is an hotel. On reaching there I had to walk from the station, as recent rains had washed away the bridge and part of the roadway and stopped the cabs. I was welcomed at the hotel in Sicilian fashion, and was given a room to myself large enough for a troop of soldiers, containing four beds quite lost in the four corners of the immense chamber. My bill was reasonable, and next morning I had the novel experience as I left of finding the whole of the hotel staff, including the landlady, assembled to say good-bye and wish me a pleasant journey. Fortunately, my stock of small coins sufficed to satisfy everybody, including the landlady. Some of the staff I had not even seen. From Modica, which much resembles Ragusa, and seemed much too rocky and barren for collecting purposes, I took the first train on to the coast and arrived at Pozzallo, the asphalte seaport, about ten o'clock in the forenoon. I had a pleasant walk, and the sun shone. I saw *edusa* in the olive gardens, and the humming-bird-hawk moth in numbers flying near the stone walls warmed by the sun; but the district is not fertile, though better than round Modica and Ragusa. In the afternoon clouds intervened, and I took train to Syracuse. On my journey, at a place called Avola, I found myself looking on a fertile district that I should like to revisit. At Syracuse I was of course dependent on the weather, which turned out unfavourable. I took a long walk towards Fort Euryalos (a good entomological locality), on my way looking into a famous satomia (stone quarry), very interesting to an archæologist, but as I saw no butterflies I took train to my old quarters on Mount Etna. I spent a day near Randazzo, mainly waiting for the clouds to break, which eventually they did for exactly an hour. I had then reached the locality where *Euchloë damone* and *Thais polyxena* occur, and these both appeared directly the sun shone, and also disappeared with the advent of clouds. I got nothing afterwards except larvæ of *Vanessa urticæ*, which was common. The following morning (May 14th) Mount Etna was hidden by clouds, and I returned to Messina with a very poor opinion of "Sunny Sicily."

Again I braved the elements, and on May 14th went with my son to Reggio in Calabria by ferryboat for a day on the hills. It was an eye-opener to come into contact with poverty unequalled anywhere I have been; the men had not even a spare sou to spend on their favourite indulgence—tobacco—and the women slave at carrying heavy burdens for the merest pittance. We had forgotten our customary "tin of sardines," and could get no eggs even at the wine shop, only bread and wine, so did not stop long. The geological strata were most striking, and entomological possibilities great; but the day was sunless, and not a butterfly was seen. The records for the third week in May are chiefly "cloudy," and also include "scirocco" and "cold and boisterous." The month practically kept up its bad reputation to the end. True, on May 23rd, I visited Mount Etna, and stopped three nights. During short intervals of sun I captured sufficient specimens of *Euchloë damone* to complete my series, but I obtained no fresh species, and several that I had taken before were not in evidence. Excursions near Messina were also made without success, owing to lack of sunshine. My most fatiguing day was May 31st. I took train to Scaletta (twelve miles) at the foot of Monte Scuderi (4000 ft.). It was cloudy, but I had hopes the clouds would break, so I walked up in order to reach uncultivated ground where it is possible to wander about quite freely. I reached the part where only the goatherd and his flock are met with, noting on the way a possible "marble white" locality. The goatherd pointed out to me the only available natural fountain of drinking water, carefully protected by his class, and I was able to eat my lunch there comfortably. Then I was tempted to go to the top, a thankless task, for the top is bare rock, and increasing clouds shut out entirely the view. I decided to return quickly, but half way down I was enveloped in the cloud, and soon was unable to see my way. Only those who have been in a cloud know what it is like. I missed the track, got amongst long grass, and when the rain came I had to sit down and wait. In common with the vegetation I was soaked through. After a seemingly interminable walk I was very glad at the first wine shop to swallow hurriedly a glass of their "cheap and nasty" wine to gain a little Dutch courage to help me to the station.

The first week in June was a continuation of the May weather, but on the 5th I started a campaign to look for "marbled whites." I crossed the straits to Scylla, in Calabria, to search for *Melanargia arge*; I reached an apparently suitable locality, but met with no success. Possibly I was too early, the season being late, or the "scirocco" stopped its flight. My captures were *egea*, one; *dorilis*, one; *mera*, a few; and others.—J. PLATT BARRETT; "Westcroft," South Road, Forest Hill, London, S.E.

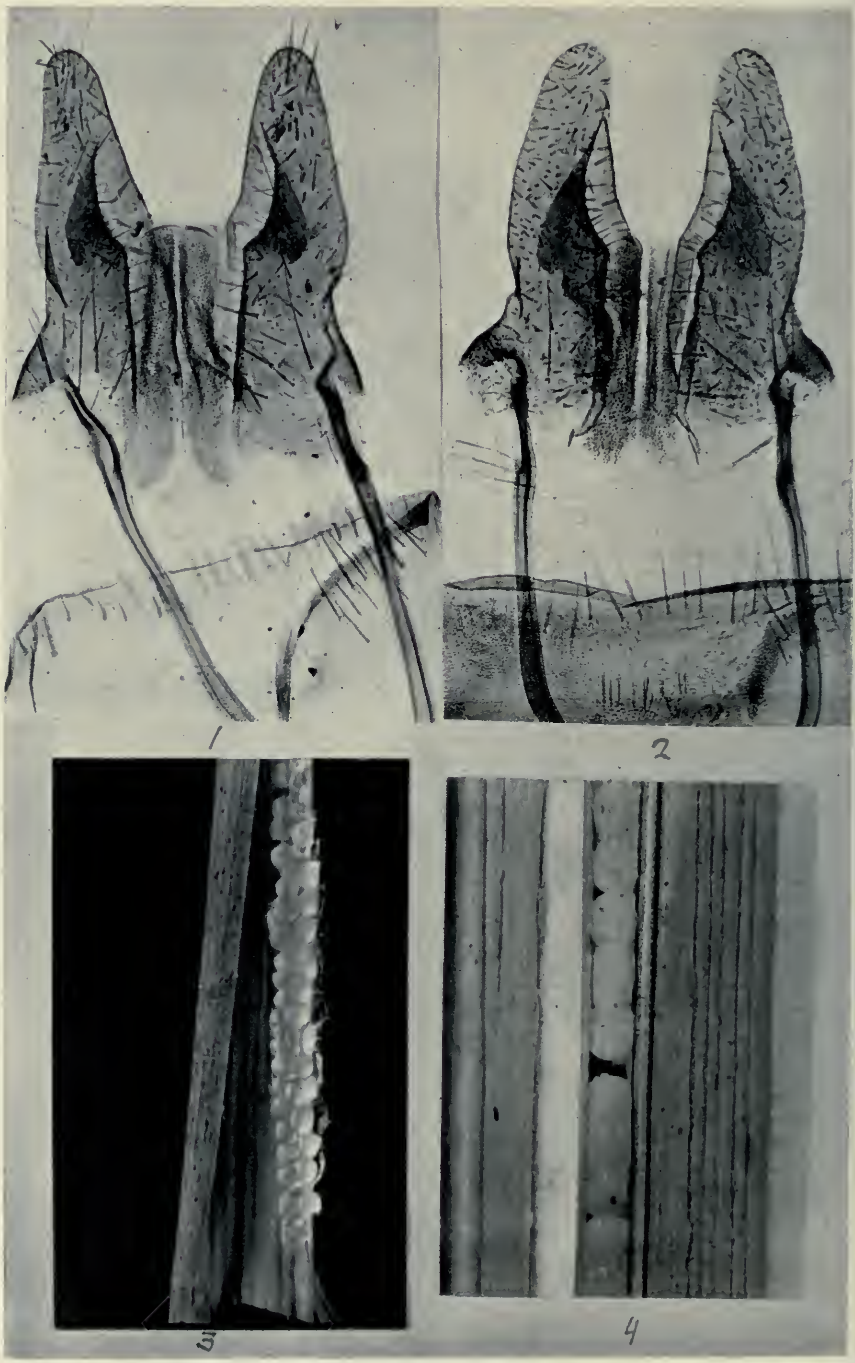
(To be continued.)

SOCIETIES.

The South London Entomological and Natural History Society.—*May 9th.*—A. E. Tonge, F.E.S., President, in the chair.—Mr. J. E. Gardner, of Upper Clapton, was elected a member.—Mr. Jäger exhibited, for Miss Edwards, a series of *Hybernia leucophæaria* from East Grinstead, with which a large percentage of var. *marmorinaria* had occurred this year.—Mr. R. Adkin, specimens of *Dianthœcia luteago*, and read notes on the two varietal forms *barrettii* and *ficklini*. —Mr. R. Adkin then read a paper entitled "Labelling Entomological Specimens," after which a considerable discussion took place.

June 27th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Sothern Dekter, of Lee, was elected a member.—Mr. Gahan exhibited some sycamore leaves showing the mines of the larvæ of the sawfly *Phyllotoma aceris*, and the remarkable cases, in the form of little circular discs, constructed by the larvæ. These cases become detached and move on the ground by little hops, somewhat like the Mexican jumping bean.—Mr. A. Sich, specimens of the rare Micro-Lepidopteron *Coleophora agramella*, from Hailsham.—Mr. R. Adkin, a short series of *Biston hirtaria* bred from Aviemore larvæ, which fed up in 1908. The imagines exhibited emerged in March and April of this year.—Mr. Edwards, a pair of the beautiful Lycænid *Eumæus debora*, from Mexico, and a fine specimen of the rare *Epiphele eriopsis*, from Bogota.—Mr. Cowham, a fine regular variety of *Abraxas grossulariata* taken in his garden; the usual yellow markings were almost absent, and the black markings were of smaller area and very symmetrical.—Mr. Dods, a cocoon of *Platysomia cecropia*, from which the imago had emerged by the wrong end.—Mr. Goff, somewhat heavily marked specimens of *Brenthis euphrosyne* from Kent and Surrey.—Mr. H. Moore, a huge tick taken from a tortoise from North Africa.—Mr. Step read the Report of the Delegates to the Congress of the South-Eastern Union of Scientific Societies held at Folkestone in June.—Hy. J. Turner (*Hon. Rep. Sec.*).

The Manchester Entomological Society.—*March 6th.*—Mr. J. H. Watson exhibited a drawer of the varieties of *Parnassius mnemosyne*, notably vars. *haltares*, *hartmanni*, and *melaina*. He also showed a larva of the hybrid between *Cricula andrei* and *C. trifenestrata*.—Mr. A. E. Salmon showed examples of West African insects found in a Manchester rubber-works.—Mr. A. W. Boyd showed *Colias edusa* taken in Cheshire in 1912, a blue female *Lycæna icarus* from Killarney, and a blotched *Boarmia gemmaria* from Altrincham, Cheshire.—Mr. H. S. Leigh read a paper on the "Life-history of the Leaf-Insect *Pulchriphyllium crurifolium* and Mantis *Spodromantis guttata*." He gave the results of his valuable personal observations of the life-history and habits of these two insects.—A. W. Boyd, M.A., *Hon. Secretary*.



APPENDAGES OF TAPINOSTOLA CONCOLOR ♀ AND T. HELLMANNI ♀ AND OVA.

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NOTES ON THE LIFE-HISTORIES OF *TAPINOSTOLA CONCOLOR* AND *T. HELLMANNI.*

By H. M. EDELSTEN, F.E.S., & R. G. TODD, F.E.S.

(PLATE IX.)

MR. KERSHAW's notes on the oviposition of *Tapinostola concolor* ('Entomologist,' xlv. p. 256) remind us of our promise to record the life-histories of these species ('Ent. Record,' Oct. 1910, vol. xxii. p. 240). We had been discussing the nomenclature of *T. concolor* with the late J. W. Tutt, but his lamentable death put a stop to our researches, and the notes got put on one side.

TAPINOSTOLA CONCOLOR.

Ova laid between July 3rd and 7th, 1909. Ovum round, ½ mm. in diameter, of a shining dirty white colour, covered with a glutinous substance, no markings visible. The pressure of the sheathing-leaf slightly flattens the ova. Commenced to hatch July 20th, 1909.

Larva. July 25th.—Length 2½ mm. Yellowish white, head rather large, and of a brownish yellow colour. Thoracic segments whitish. First five abdominal segments yellowish, rest whitish; anal plate blackish; body tapering from head downwards. A few small bristles from tubercles. Larva full-fed, May 16th, 1910.—Rather stumpy, swollen in the middle and tapering towards head and tail, but rather more towards the head. Head yellow-brown, shining and rather indented, and partly withdrawn into prothoracic segment. Plate on prothoracic segment shining ochreous; plate on anal segment also of same colour, and extending to thirteenth segment. Colour of larva creamy white with a slight pinkish tinge along the back. Spiracles black. True legs yellowish; prolegs white; hooks blackish. Tubercles with black bristles. Length 20 mm.

Pupa.—12½ mm. long, shining brown. Kremaster with two sharp bristles curved outwards, enclosed in a stout earthen cocoon.

Parasite.—*Cœlinius gracilis*, Hal.

The eggs are laid in batches within the sheathing-leaf of the flower-stem of *Calamagrostis epigeios*, and the larva enters the stem and feeds downwards, and hybernates towards the base of the stem. In the spring when the grass begins to shoot again, it feeds low down among the basal shoots. It enters several plants before it is full-fed. When about to pupate, it enters the earth and spins a strong cocoon.

TAPINOSTOLA HELLMANNI.

Ova laid August 8th–12th, 1909. Ovum round, ½ mm. in diameter, colour creamy white, covered with a glutinous substance, no markings visible, except some very slight ribbings, but these were most likely caused by the pressure of the grass-stem. Commenced to hatch August 18th, 1909.

Larva.—Length 2½ mm., of a shining whitish colour; head rather large and of a light yellowish brown colour; prothoracic plate creamy; anal plate blackish; body covered with fine hair. Larva full-fed, June 15th, 1910.—Length about 20 mm., tapering from middle to head, rather less towards tail. Colour creamy white; head brown. Prothoracic plate ochreous; anal plate ochreous, except the front part of it, which is blackish, and it extends to thirteenth segment. True legs yellowish; prolegs creamy with black hooks; spiracles black. A few bristles from tubercles. A good many bristles on anal plate.

Pupa.—12 mm. long, shining yellow. Kremaster with two long straight spines, and two short hooks curved outwards, enclosed in a stout earthen cocoon.

The eggs are laid in batches within the sheathing-leaf of the flower-stem of *Calamagrostis lanceolata* and *C. epigeios*, and the larva enters the stem and feeds downwards, and hybernates towards the base of the stem. In the spring it feeds in several plants before it is full-fed. It leaves the plant when about to pupate, and spins a strong earthen cocoon.

The larvæ of *concolor* and *hellmanni* are so very much alike that it is difficult to tell them unless one has them side by side. They feed in identically the same way, and their habits are similar. They cause the leaves to turn yellowish and wither, but are hard to find, as there are all the old leaves about in the spring. The only way to find the larvæ is to seek for isolated plants, part the herbage right down to the root and see if there is any frass or a yellowish leaf. The larvæ are more often than not just below the surface of the ground, as *Calamagrostis* is a deep rooting plant. Buckler's figure of the larva of *fulva* (vol. 4, Noctuæ, pt. i. plate lx. fig. 4) gives an excellent idea of the shape of the larvæ of both *concolor* and *hellmanni*. *Concolor* is on the wing at the end of June and early July. *Hellmanni* appears in Wicken Fen about the first week in August, but in Huntingdonshire and Northamptonshire it appears at the same time as *concolor*. The Wicken specimens of *hellmanni* are generally paler than the Hunts and Northants specimens, which are of a much deeper colour. The anal appendages of female *concolor* and *hellmanni* are admirably suited for prizing open the sheathing-leaves of *Calamagrostis* stems whilst the ovipositor is thrust within. The photographs show them flat out. In the living insect they are folded together and are just visible. We are indebted to Mr. Main and Mr. Tonge for the photographs, and to Rev. C. R. N. Burrows for the preparations.

EXPLANATION OF PLATE IX.

1. Appendages of *T. hellmanni*, female, × 50. 2. Appendages of *T. concolor*, female, × 50. 3. Ova of *T. hellmanni*, × 5. 4. Ova of *T. concolor*, × 10.

AS OTHERS SEE US.

THE following account of the Second International Congress of Entomology, published in the 'Berliner Tageblatt,' of August 24th last, is from the pen of one of the German members, Herr Fritz N. Wichgraf:—

The first international assemblage of entomologists which took place in Brussels two years ago has been followed by a Second Congress in Oxford.

It was a most happy thought to welcome the solitary members to certain of the colleges, of which there are twenty-five in the town; whilst the married couples found the friendliest hospitality in the houses of the University Professors. I had the good fortune to be quartered in Wadham College, close to the Museum which was the scene of our activity, and nothing more charming could be imagined than my bedroom and sitting-room, with its panelled ceilings of old oak and every modern comfort in its tasteful furniture. The great bay-window in front, with its broad window-seat, looked on to the broad lawn of the cloister-courtyard, I might almost say; whilst another commanded a glimpse of the green trees of the garden. No motors, no electric tram. What an ideal spot for study!

We can scarcely have a conception of these gardens, or rather parks, of the colleges. Each might be a corner of "Sans Souci," but with ancient trees of every species in an extraordinary state of healthy vitality, and a luxuriance of vegetation which seemed almost tropical. The box becomes a veritable tree, whilst an infinite variety of conifers, notably cedars and araucarias, flourish in profuse perfection. This is accounted for by the richness of the soil and the damp warmth of the climate, for we had heavy showers every day.

But for the opening festival the sun shone brightly, and at ten o'clock the crowd of members assembled full of mutual interest. In all directions there was a cheerful Babel of greetings from those who had last met at Brussels, and as to the Englishmen, who were naturally in the majority, it seemed as if the freshness of their climate had affected the character of their fine heads and active figures, whether in white-haired age or the vigour of youth. In the large assembly-hall, full of ladies and gentlemen, Professor Poulton made a punctual appearance. The Curator of the Museum and President of the Congress has a white Bismarckian moustache, and thick conspicuous eyebrows standing out crescent-wise. Mounting the rostrum he spoke a few impressive words as to the importance of the Congress, and in a brief retrospect reviewed the history of the Hope Museum, and the untiring industry of his predecessors, displayed in its different sections. He called attention to the highly interesting special exhibits, which, indeed, bear brilliant witness to the lofty standard entomology maintains in England, the classic home of this science. They must, indeed, operate materially in spreading the knowledge of subjects connected with natural history.

After the Secretary had read the list of future proceedings, Professor Poulton took the materials in his hands for his striking demonstration concerning the group of *Papilio dardanus*, Brown, in Africa (a white "swallow-tail"). The female gives astounding proof of the power of mimicry of her species, for she appears in red, black, and yellow, and without a tail, in inexhaustible varieties, seeming to belong to groups remote from those of her male. In Madagascar alone she remains true to type. Is that to be pronounced the limit to its operation?

The next speaker was the younger son of Lord Rothschild (specialist in fleas), who solicited support for the institution of a society to be founded for the general establishment of Nature Reserves to check the damaging effect of ever-encroaching cultivation upon the insect-world struggling for life with an ever-increasing difficulty, often terminating in the extinction of an entire species.

It would be impossible to give a full report of the work of the next few days, or rather, it may be said, of the quintessence of years of tireless industry and patient research. . Suffice it to say that no aspect of the marvellous secrets showing the incessant activity of Nature was neglected, whether from an economic, pathological, geographical, or systematic standpoint. And that evolution, bionomics, the theory of mimicry, morphology, and anatomy are not neglected, the guides of the Hope Museum, so ably competent for their tasks, gave ample testimony. Nomenclature is always a knotty point, and it was a satisfaction to me to find that hard German heads were ready for argument. The general debate gave a shining example of unanimity, and this unanimity bids fair to lead to definite results. It was all the more pleasing because so many peoples and languages were represented. England was naturally in the majority, then North America, Germany, Belgium, France, Austria, Holland, Spain, Sweden, Switzerland, Luxembourg, Egypt, Chile, Canada, the Sandwich Islands, British East Africa, and Borneo.

By a vote of the General Committee at the end of the Congress, a Central Commission was established in all the leading countries, in connection with local societies, to unite them, and to supply, if possible, definite answers to all entomological questions by recognized authority. This is an important step forward, and gives assurance of sound basis which can be relied upon to end the disunion and misunderstandings formerly too frequent.

Finally, there was the visit to the seat of Lord Rothschild at Tring, with the splendid and unique Museum of his son and heir. Greeting his guests in three languages, he paid a most grateful tribute to his old friend and counsellor, Dr. Albert Günther, whom he had to thank for turning a boyish love for catching butterflies to an earnest resolve to devote his life to the study of Nature, especially concerning birds and butterflies. What he has accomplished is well known to us, notably in his classical work upon Sphingidæ, and here we were strikingly reminded of it. He also, like his comrades at Oxford, had provided us with special examples of the richness and variety of specimens contained in the Museum. It was the Ornithoptera of New Guinea and the Indian Archipelago, in all their gorgeous colourings, to which attention was specially directed. Where less favoured mortals think themselves lucky in possessing a single pair, here were magnificent rows exhibiting every possible variety.

A walk through the beautiful garden, radiant with flowers, a glance at the superb stables, a drive of twenty minutes to the station, and the Second International Entomological Congress was at an end.

Fritz N. Wichgraf. (*Translated by* L. R.-B.)

A HOLIDAY IN NORFOLK.

By the Rev. W. G. Whittingham, M.A., F.E.S.

In a year which will long be remembered for the wettest and most disastrous August in our memories, an account of a collecting holiday which was in some respects distinctly successful, and had some unusual features, will perhaps be read with more interest than it would afford under more ordinary conditions.

An idea had been in my mind for a year or two of taking a collecting holiday on the Broads by the aid of a boat; and when my friends, Rev. J. W. Metcalfe and Rev. J. E. Tarbat, proposed a joint expedition, the opportunity for putting one's idea into practice presented itself. Accordingly we engaged a twelve-ton yacht, and on July 29th I arrived at Potter Heigham on a most uninviting day, after a journey from Leicester, during which it had rained hard the whole time. My friends, who had already spent a week on the coast, where Mr. Metcalfe had made the interesting discoveries of *Lithosia pygmæola* and *Crambus fascelinellus* he has already recorded, had established themselves on the boat and laid in stores. They described the consternation of the skipper when they arrived with their luggage, and his dismay when they told him the man who was coming would have much more. Our first proceeding was to go through a process of unpacking and sorting and stowing of necessaries into lockers; portmanteaux and bags and whatever could be dispensed with being despatched by carrier to Wroxham, where we expected our expedition to end. Even thus the spare bunk (there were four) was loaded with setting-boxes, lamps, and other paraphernalia, and we felt it was not altogether a matter for regret that a fourth member had not been persuaded to join our party. The boat was, however, well equipped with many ingenious contrivances, and answered our purpose admirably; and, as for the skipper, we could not have had one more pleasant and reliable, whose interest in our proceedings was genuine and increasing, although there was a smile in the background, especially in the presence of his mates; and if he did his best to make sailors of us, he, for his part, was ready to learn something about moths.

As soon as we were settled we took stock of the wind, and decided that it would be wise to go first up the Thurne to the purlieus of Hickling Broad and Horsey Mere. We lay up a little before dusk in a promising spot, and after supper set out with our hand-lamps. The evening was still though cold, and a certain amount of cloud gave hopes of a propitious start, but as the night came on the clouds dispersed and banks of white mist lay here and there. It was the kind of evening when nothing would fly, and searching at first only revealed a *Scoparia pallida* or two and *Crambus culmellus*, though a few *Leucania straminea* and *Calamia phragmitidis* were netted. The marshes were horribly wet, two or three inches of water everywhere, though later experience led us to regard that as comparatively dry ground. Mr. Metcalfe, who has intuitions of the right thing to do, had his attention attracted to a number of heaps of cut rushes that had evidently lain for a few weeks and had not been carried, and he soon shouted that here, creeping out of the heaps, was *Nonagria neurica* (*arundineta*). We all set to work searching the heaps, and after a couple of hours we had secured between us two or three dozen. *Chilo phragmitellus* and a single *Apamea leucostigma* were virtually all the other moths we saw.

This success with an insect that on previous occasions had only been picked up in twos and threes determined us to stop for another night in the same place. The evening of the 30th was more promising, with more cloud and a fair breeze blowing, and we got out our sheets and lamps and had our meal early. While this was preparing, one of our number, strolling out with a net, shouted that *N. neurica* was already there. We had our meal, and netted a few *Cœnobia rufa* before the more serious work commenced. We had high expectations, but none of us dreamed of the extent of our realization; *neurica* may be said to have been swarming. Nearly every heap of rushes produced one or two at least; most of them, especially in the wetter places, produced them in dozens and scores. Several were paired. The best heaps took us into very wet ground, and two of us went into holes half-way up our thighs and took an involuntary seat in cold water, but such incidents were of small account. We stopped at last almost ashamed of taking so many and got our lamps alight at the sheets, but here there was little result. The moon was shining now, and a couple of *Nonagria brevilinea*, a bright red *Spilosoma fuliginosa*, with a few more *C. phragmitidis*, *C. phragmitellus*, and *S. pallida* were all that came to our nets.

The presence of this insect in such large numbers in the cut reeds was very remarkable. Some of them had certainly pupated there, for we found one or two with the wings hardly dry. They could hardly, however, have crawled away from the reed-beds and found out the heaps for the express purpose of pupating in, in such numbers. The probability is that those which emerged there were already pupæ at the time when the reeds were cut. The presence of newly-emerged females, though in small numbers, would naturally attract males; but if this were the only explanation one would have expected to find a large preponderance of males, whereas the two sexes were in approximately equal numbers. Probably the coincidence of two or three causes brought about the result which proved so interesting to us—a specially good year for *N. neurica* (later experience bore this out), delay in the carrying of the cut reeds, some of which contained pupæ, and the rough weather, which sent numbers of insects to them for shelter. A few other moths were found in the same place. The females varied greatly in size; the largest I have measures 29 mm. from tip to tip across the expanded wings, and the greatest breadth of the fore wings is 5½ mm.; the smallest is barely 20 mm. across, and the breadth is 3½ mm. The males are more uniform, but invariably small.

We resolved that next morning we would be off to new ground, but next day brought a gale of wind and torrents of rain which made sailing out of the question, and with our hands full of insects to set we were content to stay, hoping to get off in the afternoon. But the rain held till six o'clock, and we finally decided to make another night of it where we were. That evening it blew hard, though the rain stopped, and we made our way with sugaring-tin to the shelter of a clump of alders and oaks, and sugared the flower-heads. In the shelter of the trees all the moths out were flying, and there we had our solitary successful night with sugar. We took a number of *Apamea leucostigma*, including some good var. *fibrosa*. Flying were a few *L. straminea* and *Lithosia griseola* and *stramineola*. Such moths as *Apamea didyma*, *Triphæna comes*, and *Leucania impura* were in some numbers, as well as what appeared less likely on the marshes, *Agrotis nigricans* and *A. tritici*. *Calamia phragmitidis* was again present, and *Leioptilus microdactylus* was taken from the flowers of the *Eupatorium*; and on our way back (our consciences having quieted themselves since the previous night) we got a few more *neurica* from the reed-heaps, as well as one or two flying.

At whatever cost we decided to leave the next day, but our skipper had a new sail which he had no intention of reefing if he could avoid it, and as it blew very hard again, we waited till the afternoon. Two or three larvæ of *Arsilonche albovenosa* were found during the day, and a *Plusia festucæ* which emerged after pupating, on September 14th. At four o'clock we got under weigh. The wind fell into a dead calm, and some "quanting" and towing were necessary, and we finally lay up near St. Benet's Abbey at nightfall. We made hurried preparations, but the night proved unpropitious, and with one exception, which from other causes was a failure, all the remaining nights were clear and cool, with heavy dews, and hardly anything flew. Sugar and sheet were alike unproductive. At St. Benet's our hand-lamps gave us some *N. brevilinea*, in good condition for the most part, a few *A. leucostigma*, several *Tapinostola fulva*, both pale brown and a bright red form. *Epione apiciaria* was in numbers, as it was in most places, and we also took *Phibalapteryx vittata*, *Eupithecia tenuiata*, *Peronia shepherdana*, and *Pædisca semifuscana*, the last very varied, including the striking variety with white inner margin.

The next night we lay at Ranworth, and now we had hopes of *Lithosia muscerda*—hopes which were doomed to disappointment. *N. brevilinea* was again netted and taken at rest, together with most of the other moths already mentioned, including *N. neurica*, and in addition the following:—*Apamea ophiogramma*, *Coremia designata*, *Acidalia immutata* and *emarginata*, *Drepana falcataria*, *Selenia bilunaria* var. *juliaria*, *Ditula semifasciana*, *Penthina betulætana*, *Phoxopteryx siculana*, and *Grapholitha nisella* and *G. penkleriana*. A batch of *Peucedanum* gave larvæ of *Papilio machaon*, mostly full grown. A couple of pupæ were also found, which emerged later in August.

On August 3rd we lay at Horning, and here we had our solitary really cloudy night, and spent a hour before dusk before an alder-car, in the hope of seeing *Lithosia muscerda* fly, but none made its appearance, though a Norwich collector netted one on the road opposite the ferry. There was an east wind, and rain came on with the dark. When it ceased we again found *N. brevilinea* and other Noctuæ by searching. *P. vittata* came to light in some numbers, with *A. immutata*, a single *Eugonia alniaria*, *Nudaria senex*, and *Pyrausta aurata*. We had worked for Tortrices in the afternoon, but little appeared except a few of those already mentioned and *Grapholitha ramella*.

On Sunday morning we were at Ranworth Church, with its beautiful screen, and in the afternoon, when the river was alive with yachts, which add so much to the interest and charm of a Broadland holiday, we started to go up the Ant to Barton and Stalham for *Nonagria cannæ*. Our skipper warned us to "stow well," but as the boat lay over, the table in the cabin, against which our insect-boxes were resting, broke away, and one of us went into the cabin to preserve order. Then came an amusing and for the moment alarming incident. A sudden gust of wind laid the boat with unreefed mainsail right over, and brought the water well over the combings up against the cabin-side. One of us on the stern counter drew up his legs and hung on for dear life, while the man in the cabin was bombarded with insect-boxes, lamps, a 7-lb. tin of carbide, and various impedimenta, and sudden spasms shot through us at the prospect of all those *neurica* coming to a miserable end. We ran the bows ashore, and lay on for the wind to moderate, and a rapid inspection showed that beyond the loss of a few pins no damage was done. We were soon able to proceed, and after lowering the mast to go under Ludham Bridge we ran up the Ant under the jib. A look round with the hand-lamps gave us again a *N. neurica* or two fluttering among the reeds.

The next day we took the dinghy, and, landing, set to work at the bulrushes for the pupæ of *N. cannæ*. Our first results came from the stems of *Typha angustifolia*, working from the back—that is, the shore side; but presently, coming across a small clump of *T. latifolia* not more than a few yards square, we found a dozen in as many minutes. They were mostly pupæ, but we found three or four larvæ that had not yet pupated, one of which, at all events, has safely pupated since. *Nonagria arundinis* was naturally very abundant. Altogether we found two or three dozen *N. cannæ*. It is advisable not to cut the rushes at first, but to pull away carefully the outside leaves, and when the pupa is seen to cut away the piece of stem containing it. The pupæ were subsequently laid on damp flannel, and at the time of writing several have successfully emerged, also some ichneumon flies!

From a large number of rushes the pupæ or larvæ had been eaten out. Is it rats or duck that eat them out in this way? It is always a little above the water-line, and the stem is well mauled. *Cannæ* larvæ appear to feed on the fringe nearest the shore, *arundinis* right into the deeper water; but in a wet season like this all the marsh is water-logged, and we were often knee-deep in getting them.

At night we added to our captures again *N. brevilinea*, red *T. fulva*, a large number of *P. semifuscana*, a single example of the bright Norfolk form of *Celæna haworthii*, and more *Nudaria senex*, *P. vittata*, &c. Two full-fed larvæ of *Chærocampa elpenor* were found during the day, one of the green and one of the brown form.

In the expectation of a strong wind, we were roused at 4.30 a.m. next day, and it was well we came away as we did, as a boat lying near us, which started a few hours later, lost her jib and got into difficulties. Five hours' hard work saw us again at Ranworth with keen appetites for breakfast.

During the afternoon our skipper, whose interest in Lepidoptera was growing apace, offered to row us round in the dinghy to find more pupæ of *N. cannæ*. The search proved fruitless, but the skipper, who was working on his own account, produced a damaged *typhæ* pupa, and what he termed "a wriggler," which proved to be the larva of a mosquito. It was summarily executed, but the serious toll of blood and subsequent irritation must be taken into account when collecting from a yacht.

The evenings became less and less productive. On this our last but one we took nothing but three or four *N. brevilinea*, a single *neurica*, and a few *C. phragmitidis*. On our final evening we lay off Wroxham Broad, probably in too cultivated a region for the best results. The day promised well, but the heavy clouds and close atmosphere which raised our hopes resulted in what Norfolk people call a "tempest," with drenching rain late in the afternoon, but afterwards it cleared up, cold and still, and stars were visible. The solitary moth that came to light was a *Noctua rubi*, but in addition to adding to our captures of *P. vittata*, *A. immutata*, &c., we took a good series of *Crambus selasellus* and a *Lobophora viretata*.

This was a poor enough ending, but on the whole, in spite of bad weather, of which we had every variety, wind and wet and cold, we had little reason to regard the holiday as other than successful. *Muscerda*, indeed, we did not take, nor did we see a sign of such insects as *Schœnobius mucronellus* or *gigantellus* or *Calamotropha paludella*. The special Broadland Micro-Lepidoptera were, with the exception of *Peronea shepherdana* and *Pædisca semifuscana*, absent; Tortrices as a whole, indeed, were very little in evidence, and common Noctuæ few in number, but *Nonagria cannæ*, *neurica*, and *brevilinea* were in themselves a good return, and the extraordinary take of *neurica* is a thing to remain among the great collecting memories.

At the end of the cruise my friends left me, and I had a fortnight on the coast without them. A little bit of isolated marsh produced, among other things, *Cœnobia rufa* in abundance, the second brood of *Eupisteria obliterata*, and some *Orobena straminalis*. On the sandhills the coast Noctuæ were not so plentiful as usual, and by day these regions seemed almost devoid of insect-life. At night, however, there were many interesting insects to be seen. *Agrotis tritici*, chiefly light, bright forms, but with some interesting dark varieties, was most frequent. *A. vestigialis* was also in some numbers, and *A. cursoria* more rarely. *Apamea didyma* and *Miana bicoloria*, which are generally abundant, were in quite small numbers. There were some *Leucania littoralis* and a few *Tapinostola elymi*, but this last was in poor condition, and scarcely worth taking. At rest on the marram-grass were several *Lithosia complana*, and sometimes this species flew to the light. In the same way *Aspilates ochrearia* (in plenty), *Anerastia lotella*, *Crambus geniculeus*, and some *C. pinellus* were found. This last insect, which hardly ever appears in any number, turns up in very unexpected places. I do not remember seeing it on coast sandhills before.

By far the most interesting insect that I captured on the coast was *Crambus alpinellus*. I came across it in considerable numbers, nor did I find, as Barrett records, that it was loth to appear during the day. It was the solitary insect that flew before sunset on the part of the coast where I found it. Unfortunately it deteriorated rapidly in the rough weather prevailing.

It was seldom worth while putting up the sheet. One night, however, which gave more promise than most, there flew to light, together with *L. complana*, some of the commoner Noctuæ, *Notodonta ziczac*, and curiously (as there was no oak for a considerable distance), *Drepana binaria*, once more, of all things, a specimen of *Nonagria neurica*! Who would have looked for this on a sandhill? There were, of course, drained marshes not far away, the grazing-ground of cattle and sheep, and in the ditches and by them a few lines and patches of reed remained, but mere fragments. It is curious that such an obscure insect should have found enough cover to hold its own, and have flown up to light away among the marrams.

Of Tortrices I beat out a few *Sericoris bifasciana* and *Eupœcilia atricapitana*, and from a cluster of pines a number of *Retinia*, whether *sylvestrana* or *posticana* I have not determined; they were a good deal worn. In either case they are interesting insects for the county and date.

After the deluge of the 26th, which left the county in such a deplorable plight, little was to be done, though I found *Crambus* *alpinellus* had survived it, and *Aspilates ochrearia* was still in excellent condition. I was surprised also to take off sugared marram one example of *Dianthœcia cucubali* and one of *D. carpophaga*, in each case in very good order. I spent the last two days in inspecting some of the results of the flood, and in having a last determined search (I had made three previous expeditions) for the larvæ of *Eupithecia extensaria*. On my last day, and literally in the last hour, for it was five o'clock, and I was several miles from the place at which I was staying, I came across it. It was quite a satisfactory ending to a holiday.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief Gervase F. Mathew, R.N., F.E.S., &c.

(Concluded from p. 268.)

There was a good deal of wind and rain for the first half of the month of October, and very little outdoor work could be done. On the 10th I noticed that about forty larvæ of *C. phlæas*, which had been hibernating under dead leaves, &c., suddenly began to feed again, and in the course of a few days rapidly increased in size, and I thought they were going to spin up and produce butterflies at the end of the month. One spun up, but failed to change to a pupa; the others ceased to feed after about a week, and eventually they all died. The mild weather during the middle of the month must have affected them. *Collix spartiata* began to appear in breeding-cages on 14th. The 18th (St. Luke's Day) was beautifully bright and warm, and the next day much the same up to noon, after which it clouded over. However, it felt very mild, and there was a soft south-westerly breeze; so I went to the woods and tried sugar. Moths were plentiful, particularly *C. vaccinii*; the others seen or taken were *Agriopis aprilina*, *Amathes rufina*, *Scopelosoma satellitia*, *Agrotis segetum*, and *Miselia oxyacanthæ*; also *Oporabia dilutata* came fluttering round my lamp once or twice. This was my last night in the woods, as the weather became colder, and we had a spell of east and north-east winds. On the 20th *C. miata* was taken at rest on a wall. On the 25th there was a good deal of sun, though it was by no means warm. I saw *P. atalanta* flying in a sheltered place. There was a good deal of rain and wind throughout November, but it was mild for the most part, the only frosts being on nights of 11th, 22nd, and 23rd. *O. dilutata* was bred on the 1st, *Hybernia defoliaria* on 10th, and *H. aurantiaria* on 17th. December, generally speaking, was mild, with a large amount of rain and occasionally heavy gales. The only frosts were on the nights of 6th, 11th, and 22nd, and they were very slight. The last four days of the month were remarkably mild, with a densely overcast sky, and thick drizzly fogs on 28th and 31st. On 30th there was a little sun, and I saw bluebottles flying about, and spiders were spinning their webs. *H. defoliaria* was bred on 16th, a very dark, almost unicolorous, male; and on 29th I noticed a dead larva of *L. favicolor* hanging to the muslin hood of its breeding-cage. All my breeding-cages are kept in an open shed out of doors facing north-east. A mild, muggy winter is fatal to many hibernating larvæ; I have often come across them dead and flaccid when I have been pupa-digging, so they appear to suffer just as much in a state of nature as they do in confinement, in open weather.

Taking it all round, the very remarkable year of 1911, almost certainly the hottest and most brilliant on record, has not been an exceptionally favourable one for the lepidopterist. Many species that are usually plentiful in ordinary seasons were either very scarce or not seen at all. In the spring the hibernating Vanessids were hardly seen. I only noticed one or two examples of *urticæ* and *io*, and not a single *polychloros*, *atalanta*, or *cardui*, and in the autumn they only appeared in small numbers. *Polychloros* I have not met with for some years. The Pierids, too, were far from numerous, either in the spring or autumn. On the other hand, the second and third broods of *L. icarus* and *C. phlæas* were in great profusion. Bombyces, Noctuæ, Geometræ, Pyrales, and Tortrices were, with the exception of a few species, certainly far below their usual numbers. One of the chief features of the season was the abundance of individuals of some of the second and third broods (notably *L. pallens*, *N. c-nigrum*, *N. rubi*), and the smallness of the specimens, and, among the Geometræ, *T. amataria* and *A. emarginata*. Sugar seemed to have no attraction, except on the marshes, until long after midsummer, on account of the immense amount of honeydew, which was so thick on the leaves that an ordinary shower failed to remove it. It was also a very poor year for larvæ. In the spring the hibernating Noctuæ and Geometræ were by no means plentiful; and later on, at the end of May, such species as *H. defoliaria*, *H. aurantiaria*, *O. dilutata*, *C. brumata*, &c., were very scarce. The oaks and undergrowth in woods, which are often stripped of their leaves, showed very slight signs of having been eaten, and the usually abundant *Porthesia similis*, *Malacosoma neustria*, *Lasiocampa quercus*, &c., were few and far between. At the end of summer and early autumn there was no improvement. I did not notice any *Hadena oleracea*, which in most years swarms on the tamarisk, and only one or two *H. pisi*, two *Cucullia asteris* (often common on sea-aster), and very few *Smerinthus populi* on the poplars. The most common larva was that of *Phalera bucephala*.

In the woods it was just the same; nothing was to be found on the aspens and sallows, and even in the cottage gardens, where in an ordinary season many of the cabbage and broccoli plants exhibit nothing but their ribs, the leaves last year were almost all intact.

Lee House, Dovercourt: Jan. 9th, 1912.

NOTES AND OBSERVATIONS.

Correction.—By some oversight the legends to the figures of larval siphons in my paper on British Mosquitos in last month's 'Entomologist' were reversed. Fig. 4 represents *Theobaldia fumipennis* (Stph.) (= *theobaldia*, Meij.), and fig. 3 is *Th. morsitans* (Theo.). I should have stated that these two species belong to the group *Culicella*, now included by Dyar and Knab in *Culex*. In my opinion, however, the structure of the male palpi and genitalia and of the legs places them rather in *Theobaldia*.—F. W. Edwards; British Museum (Natural History), September 24th, 1912.

Lycæna argiades (Life-history of): an Amendment.—My attention has recently been called to a footnote on p. 78, vol. iii., Tutt's 'British Butterflies,' which criticises my statements referring to the cannibalistic habits of *Lycæna argiades* larvæ as follows:—"Frohawk's details of this (Entom. xxxvii. p. 245) must be taken with caution. On p. 246 he states that 'all the eggs hatched on the same day, July 30th, 1904,' and that 'the first moult took place on August 3rd.' On p. 243 he stated that he 'noticed one larva, after the first moult, feeding on a newly hatched larva, which it had seized as it emerged from the egg,' which is very wonderful, if both statements be studied together." These facts are easily explained, as I find, on reference to my note-book regarding this species, an entry stating, "I received from Mr. Hugh Main, July 21st, 1904, some larvæ and ova laid by a female taken by Dr. Chapman, South France." The larva alluded to, after the first moult (Entom. p. 248), is one of those received on July 21st, which I had placed with the newly hatched larvæ on July 30th. I admit I might have made the statement clearer by mentioning the fact I had larvæ already feeding previous to those that hatched (July 30th) from the second lot of eggs received on July 26th.—F. W. Frohawk.

Notes on Colias edusa, Pyrameis cardui, &c.—The present year gave promise of yielding large numbers of *Colias edusa* and *Pyrameis cardui*. I do not know how far the promise has held good, but my own experience has been disappointing. The first appearance of British-bred specimens that I noted was on July 20th, at Dover, where two male *C. edusa* and one var. *helice* put in an appearance. At the field meeting of the South London Entomological and Natural History Society at Otford, on July 27th, I personally saw three male *edusa*. From that time until August 17th I had no opportunity of observation, but on that date I went to South Devon until September

11th. The weather during my stay was unsuitable for butterflies, to express it mildly, but there was some sunshine, and I saw nine specimens of *edusa* altogether, the last on September 7th. *Pyrameis atalanta* was very plentiful, and there were a few *P. cardui*, *Vanessa io*, and *V. urticæ* to be found, with considerable numbers of *Pararge egeria*, *P. mægera*, *Epinephele ianira*, *E. tithonus*, and other common butterflies, and mostly in battered condition. Insects were apparently somewhat out of date, for *Abraxas grossulariata*, *Lasiocampa* (*Bombyx*) *quercus*, and *Hydriomena furcata* (*elutata*) were not uncommon, and *Argynnis paphia* was seen at Tavistock on September 2nd. Local variation was disappointing; *E. ianira* differed little, if at all, from Kentish specimens, and the only species which showed signs of having been interesting was *E. tithonus*. Sugar proved attractive, yielding many common species in abundance, and Geometers were fairly plentiful in the hedges, but nothing appeared that I should not have expected in early to mid-August. The only fresh emergences I noted were *Pararge egeria* and *Mesoleuca ocellata*. No doubt the unseasonable weather accounted for this, and has, I fear, sadly lessened the numbers of *edusa* and *cardui*.—B. W. ADKIN; 8, Hope Park, Bromley, Kent.

COLIAS EDUSA var. HELICE IN KENT.—I am glad to record two very fine specimens of *Colias edusa* var. *helice*, taken by Mr. Bristowe, of this neighbourhood, during the last week in August near Minster-on-Sea, Kent, He saw one or two more during the fitful sunshine we had about then, but was unable to take them. — STANLEY A. BLENKARN, F.E.S.; Norham, Cromwell Road, Beckenham, September 17th, 1912.

COLIAS EDUSA var. HELICE, &c., IN CHANNEL ISLANDS.—It may be of interest to record the capture of two fresh specimens of *C. edusa* var. *helice*, on August 2nd, in Alderney. The typical form was very common. I also secured a fresh specimen of *Macroglossa stellatarum* on August 12th. In Guernsey I met with a newly emerged *H. jacobææ* on August 22nd. This is rather a late emergence, I believe.—HUGH G. LE RAY; 11, Wontner Road, Upper Tooting Park, S.W., September 4th, 1912.

COLIAS EDUSA, PYRAMEIS ATALANTA, AND P. CARDUI AT FOLKESTONE.—All these species were common at Folkestone in July from the 26th to 27th. Larvæ of *Macroglossa stellatarum* obtained at the same time and place duly pupated, and the moths are now emerging. —H. FLEET, JUNR.; 7, Park Road, Esher, September 14th, 1912.

COLIAS EDUSA IN SOMERSET.—I saw one male *C. edusa* yesterday in a stubble-field, the only one I have seen this year.—WALDEGRAVE; Chewton Priory, Chewton Mendip, Somerset, September 24th, 1912.

ABUNDANCE OF PYRAMEIS ATALANTA LARVÆ.—There has been a remarkable abundance of *P. atalanta* larvæ this year in our local nettle-beds. I could get as many as I liked in July, and so widely extended is the brood (or is it a real double brood?) that to-day (September 22nd) I have just brought home two pupæ and several larvæ, not all full-fed. But they seem delicate insects to rear; of those I had barely 40 per cent. reached the final stage. Many died off in the change from the larval to the pupal stage, while some apparently healthy pupæ shrivelled up. I have never found the same difficulty with other species of the Vanessæ. As a matter of fact, I obtained this year about a score of *P. cardui* larvæ. They all fed up rapidly, and produced 100 per cent. of imagines.—J. S. CARTER; Warren Hill, Eastbourne, September 22nd, 1912.

CATOCALA NUPTA, ab.—On September 13th last a gardener at Uxbridge handed me a specimen of the above with the under wings almost entirely black, the usual red bands being scarcely distinguishable, a mere trace of very faint pink representing the lower of them. The fore wings, body, and thorax are also darker than usual; a very fine melanic variety in excellent condition luckily, although it had been put in a match-box.—FRANCIS B. WOODBRIDGE; The Briars, Gerrards Cross, Bucks.

CAMPTOGRAMMA FLUVIATA AND PHRYXUS LIVORNICA AT LEWES. —On the 17th inst. I took a nice fresh specimen of this insect near Lewes at rest on a grass-stem. Unfortunately it was a male. On May 27th last one of my brothers had a specimen of *P. livornica* fly into his house at Lewes about 8.45 p.m., attracted by the light. The capture was noticed at the time in a local paper, but has, I think, not yet appeared in the 'Entomologist.—HUGH J. VINALL; "Torbay," Park Road, Lewes, September 25th, 1912.

DEILEPHILA GALII: A CORRECTION. — I regret to say I made a mistake in recording the finding of *D. galii* larvæ at Burnham (*antea*, p. 231). The larvæ were those of *Phryxus* (*D.*) *livornica*, and the first imago emerged to-day. The fact of the larvæ feeding on bedstraw misled me.—H. DOIDGE; The Bank, High Street, Taunton, September 18th, 1912.

NOTES ON AGROTIS EXCLAMATIONIS, &c.—The larvæ of *A. exclamationis* have been very abundant in this neighbourhood during the past month, and have caused considerable damage in kitchen gardens among vegetables. They attack almost everything. I planted a quantity of young lettuces at the beginning of this month, dusting the surface of the ground with quicklime after the plants were put in, but in spite of this in a week there were none left. The larvæ—which at this time varied from half-grown to nearly full-fed—attack the plants just on a level with the ground, destroying the crown and causing the leaves to drop off. During the day they hide in the soil about an inch below the surface. I have turned up as many as eight or nine at the roots of a single plant. Carrots, onions, parsnips, &c., have been riddled, and stems of young broccoli, Brussels sprouts, savoys, &c., seriously injured. The larvæ that produced the first brood were also rather numerous when the ground was being dug over in the early spring. Local gardeners and labourers call them "leather-jackets," and it is a good name, too, for their skins are remarkably tough, as anyone can see who tries to crush them between his finger and thumb. They require to be dealt with with a sharp trowel. I have killed some hundreds lately. There is only one thing that can be said in their favour, and that is that they are just as fond of the roots of weeds as they are of those of vegetables, and the roots of that dreadful garden pest, the lesser bindweed, are their special favourites. At the end of June and beginning of July a smaller larva with similar habits was nearly as plentiful. These produced *A. nigricans*, of which, fortunately, there appears to be only one brood.—GERVASE F. MATHEW; Dovercourt, Essex, August 19th, 1912.

TORTRIX PRONUBANA.—Last year I was able to record the occurrence of this moth at Weymouth. This year I can do the same for Bournemouth, where it seems to occur in fair numbers. The first specimen emerged on September 4th, the second on September 18th.—(Rev.) W. CLAXTON; Navestock, Romford.

NEW FOREST NOTES, 1911.—Having been interested in the fauna—especially the Lepidoptera—of the New Forest and neighbourhood for many years, before some of the young fir plantations were planted, it was with pleasure, and I trust profit, that I perused the communications on pages 126 and 158 of the present volume. I recollect the time when all three species of butterflies, viz. *Aporia cratægi*, *Leucophasia sinapis*, and *Melanargia galatea*, were to be had, but I never knew of either species being in very great abundance, even in their most favoured localities. I have taken *A. cratægi* amongst the thorns near Boldre Wood, and the last I saw alive were near Vinney Ridge many years ago, when, with the late Dr. Rake, we were searching for the sword lily (*Gladiolus illyricus*) at the end of July; we saw specimens of the butterfly in a very tattered condition settling on the thistle-heads, and little supposed it would be a final view; I believe that was in 1874. *L. sinapis* I have taken in several parts, but never commonly; perhaps the best locality was "Stubby," where its poor weak flight was to be seen in the grassy "ridings" of the "copse," where the dingy but then much sought-for *A. caliginosa* rose in a nervous flutter, soon to descend into its former hiding-place amongst the dry grass-stems, where its plain colour, so like its surroundings, made it difficult to find. *Melanargia galatea* I have seen near Boldre Wood, and in a damp open space between that place and Lyndhurst, but never in any great numbers, such as are seen in its favoured localities. As to "chalk-loving" species being sometimes found in the Forest, I may mention that on one occasion I took a fine male *Lycæna corydon* there. I recollect once finding the moon-wort fern (*B. lunaria*) growing, and a botanical friend was so sceptical on the point that he would not believe in the "chalk-loving plant," as he called it, being found there until I brought home some roots for him, so that there seems to be no absolute rule as to the locality where insect or plant may be occasionally met with.

The Satyrinæ, such as *Epinephele ianira* and its kindred; the small fritillaries, and others are still plentiful; and that fine butterfly, *Argynnis paphia*, is still a glorious spectacle as he majestically sweeps about the blossoming brambles, always ready to fight or frolic with a comrade; and since the earlier stages of the lethargic *Zephyrus* *betulæ* are better known to the present generation of collectors, perhaps more specimens than formerly reach the setting-board. But are *A. adippe* and a few others as common as they were? whilst some seasons, such as *S. megæra* seem to disappear altogether, and if we turn our thoughts to the moths perhaps a more marked diminution is observable. We seldom hear of large "takes" of *Diacycla oo*, or *Leucania turca*, or *Œnectra quadra*, and still less of the little *L. assella*, which old Charles Turner—the "beetle man"—once took so commonly. I well recollect, too, the numbers of the pretty little burnet, *Zygæna meliloti*, I once saw floating, like small dark bees, over the bright patches of the golden-flowered bird's-foot trefoil near the railway. I understand none are there now, and if an inference may be drawn from the fact that at that time every possible specimen was netted and boxed by a very tall man (a dealer, I suspect), we need not wonder at the species becoming scarce. From the few foregoing facts it is clear that several species of butterflies (and moths) have disappeared and others become less common than formerly; but, on the other hand, is not *Plusia moneta* a comparatively new species to the neighbourhood? for, if I may judge from the number of its yellow cocoons found amongst monkshood, larkspur, &c., in some of the old gardens in the Forest, the moth has become quite an established "native"; thus some slight compensation seems to be offered for our losses, and if we try to investigate or find a cause for such changes, we come face to face with an apparently insoluble problem. The greed of collectors, parasitism, and our changing climate, cold, and damp have been advanced and discussed; and in a lesser degree the frequent and extensive fires, and even the increase of our small birds has borne some of the blame (but have they increased?); and as each point seems to arrive at some definite conclusion, do we not often find the experience of the following year "knocks the bottom" out of the argument? Some years ago the large white (*P. brassicæ*) had become very scarce hereabouts, and my friend, the late J. W. Fowler, said undoubtedly it had gone like *cratægi*, but the very next season all the cabbage tribe and nasturtiums were skeletonized by the enormous number of the high-smelling larvæ of that particular species, and many pupæ were to be seen suspended by tail and waist-belt from almost every available position, and consequently a more than usual invasion of *brassicæ* was predicted for the following season; but this did not come true, for in due course the various pupæ were found to be almost covered with the tiny yellow cocoons of the ichneumon whose work of destruction was complete—so much for parasitism. The extreme heat and unusual drought of 1911 during several months of the summer induced many ordinary single-brooded species to become double-brooded, and even a third family was produced in some cases, because, I suppose, the conditions were favourable for the stages in the early development, and it seems reasonable to argue that this is at least one of the chief factors in the future scarcity or abundance of any species. We are all well aware that in rearing insects a whole brood may be very healthy throughout their changes up to the pupa state, and then the entire family will die most miserably without any apparent cause; perhaps from a lack of something, in our ignorance, we are unable to supply. When hybernating larvæ are exposed to the many changes and mishaps by which they are surrounded, it is extraordinary that so large a proportion should survive, hence the enormous fecundity of many species; possibly in some cases not one in a thousand reaches maturity. It sometimes happens that an insect gradually becomes scarce, and each successive year witnesses a decrease. In my collecting days the beautiful *Callimorpha dominula* was very common here, the moths in their heavy and undulating flight being often seen in the street, whilst the larvæ were common upon the nettles in the lanes, though their most usual food was the comfrey and meadowsweet by the river-side. Gradually the species disappeared, and now, as far as I can gather, it is quite extinct in its old haunts. It is obvious that the number of larvæ taken and bred in the hope of obtaining the yellow variety of the moth must have helped the decrease. But there were certain parts of the river where the larvæ perhaps were most abundant, and where collectors were forbidden to go; there the large rough leaves of comfrey grow as abundantly as ever, and the scent of the flossy meadowsweet fills the air, but not a vestige of *dominula* anywhere in any stage. Will it ever occur again?—G. B. Corbin; Ringwood.

Butterfly Collecting in Sicily and Calabria in 1911.—On June 7th I took train to Syracuse (113 miles) with the intention to work back. I broke my journey at the junction station of Valsavoia, and spent three hours on the limestone slopes near the shore of Lake Lentine, but took nothing fresh. At Syracuse next day I found *Melanargia galathea* (var. *syracusana*, Zell.) in plenty, but the other species I took are not worthy of mention except one fine *helice*. On the morning of June 8th I alighted from the train at Megara Hyblea, a solitary station where the trains stop to get water for the engines. The station master strongly protested against my getting out, and urged me to go on to the next station, assuring me there was nothing to eat there. I merely touched my bag and held my ground. The station is well protected by netting from mosquitoes, and the only building near is an immense old ruin, the town being situated on the low hills miles away. Passing the station in 1910 I had noticed here a swarm of *Melanargia galathea*, and in the field between the station and the sea I found the var. *syracusana* very common. By moving about a little I obtained specimens of *circe* fresh out, *helice*, and *phœbe*; and within the old ruins, where vines are planted, pairs of *podalirius*, *machaon* and *Vanessa* were chasing each other. I had a most enjoyable day, and left early for a less malarial locality. At Catania a friend joined me, and we spent the week-end at the village of Zaffarano, on the southern slope of Mount Etna. Mainly owing to the weather our visit was not the success we hoped for, our best capture being *gordius*, rather common.

We had an unexpected festa on June 15th, and my son could join me for a day. I chose Scaletta, where I had my drenching, being keen on "marbled whites," and I had spotted a possible locality there. We hired the only cab to take us as far as the road went up Monte Scuderi, and were soon set down at a village called

Italia. At a distance it is most picturesque, and worthy the attention of an artist. At close quarters the illusion vanishes, and dirt and gloom reign supreme. Being a festa the people were all at home, and were very civil and courteous to us. On leaving the village the path soon became very steep, and a typical little Sicilian lad of about seven offered to show us the best way up—he was going to the "family" patch of ground where his father was feeding the animals. We had to climb in some places, and presently my son, who was first with his net, shouted to me there was a lot of "marbled whites." I hurried up and just caught a glimpse of one as it flew away, the rest had all gone. I recollected *japygia* and its being always in a hurry, so we sat down and waited for the return of the fugitives; they presently returned, after having circled round, coming up the hill to us. When captured they proved to be a very large form of *japygia*. Higher up the path skirted a wheatfield, and here we were puzzled by taking *galathea* almost as large as *japygia*. On reaching the ridge of the slope we were on the wind was blowing a gale, and we had to take shelter a few yards down the shady side, where we were able to take both species in plenty. In the afternoon we braved the gale, and descended into the next gorge by an almost impassable pathway—only suitable for goats—to the village of Artolia. Below the breeze was not felt, and we found ourselves in the centre of the Sicilian silkworm industry. We were freely admitted into the rooms to see the worms and cocoons, and an attempt was made to initiate me into the art of buying ova, rearing worms, and selling cocoons, in order to make a profit. At the same time I noticed that one man was told off to follow us everywhere we went, a duty he performed until he had seen us safely off in the train. Well, a couple of foreigners with nets, who arrive by a goat track down the mountain side, might well incur a little suspicion. The dirty inns, dirtier tablecloth, and poor food, together with (to me) unpalatable wine, will not attract me there often.

Summer suddenly set in in the middle of June, bright sun and intense heat, which lasted until I had had enough of it at the end of the month, when I left for England.

On June 16th we went to Gioja Tauro, Calabria, to spend the week-end, the attraction being a good hotel—the nearest hotel south is thirty miles, and north over fifty miles—between are only dirty wine shops. Next day we visited the woods skirting the shore, known as the "Bosco di Gioja Tauro and Rossana." The heat was intense, and insect life in great abundance. The hair-streak *ilicis* was flying by dozens, and the herbage swarmed with a green beetle, while the small oak trees were denuded of leaves by various hued larvæ of *monacha*. Giant heaps of dead green beetles at the side of the path through the wood puzzled us until we learnt that the work-people collect the beetles from the vines in the adjoining vineyards, put them in narrow necked jars, cork them up, and next day, when the beetles are asphyxiated, they empty them in heaps in the wood. Owing to the oven-like heat our "bag" of butterflies was small; perhaps the most interesting species being *Melanargia galathea*, very large and very dark, approaching var. *turcica*. The following day we rested during the heat of the day, and on June 18th I decided to visit the nearest hill in preference to another day on the plain. This was Monte Elia, at Palmi, the next station on the railway. At 1000 ft. altitude with a breeze the heat was just bearable. On reaching the ruined lighthouse at the top a fine specimen of *jasius* was a conspicuous object flying round like a bird, and this caused me to waste a lot of time trying to capture it. It had several narrow escapes before it flew right away. *Lathonia* was very common, but its quick flight, owing to the heat I suppose, made its capture very hard work; *galathea*, small and very dark, was also plentiful, and a couple or more worn *arge* disappointed me, as I wanted fresh examples. I rested next day, and on the following (21st) I quietly walked up our own torrent bed and was content to watch *podalirius* floating in the breeze, and *galathea* var. *procida* in its special valley. Then I descended to the cataract (cattarati), on my way picking up a series of the lovely burnet moth (*carniolica*) just out. Next I climbed the hill leading to Cammari by a mule track, until I reached the spot where I first took *japygia* in 1909 (one specimen only) and failed to get in 1910. After a long search, and when I had almost given it up, I disturbed a "marbled white," which flew off sharply, but, knowing its habit, I followed it quietly and captured a fresh specimen of *japygia*. The next day I went again and caught a fine series. Desirous of making the best use of the last week of my stay, I went to Scylla on the 24th and Reggio (both in Calabria) on the 26th. At the former place I found the headquarters for *arge*, but by this date the specimens were worn. Some cossus eaten trees attracted swarms of *Vanessa*, especially *polychloros* and including *io*, and in the wood fresh, dark *galathea* and worn *euphrosyne* were abundant; while in the open *lathonia* was plentiful and very active. At Reggio on the 26th the heat in the lemon gardens near the shore was overpowering, and the day was given up to *Charaxes jasius*. I had the good fortune to catch the first specimen we saw, but after that we were unlucky, and the numerous specimens we saw kept out of our reach. On the following day, the 27th, I visited Monte Cicci and captured two *jasius* out of three that I saw. I may mention that earlier in the year my friends and I carefully searched for larvæ of *jasius* without success, as it is much best bred. On June 29th three of us climbed Monte Cicci to look for *Libythea celtis* (I took this species here in 1909), and for more *jasius*. We saw no *celtis*, and only one *jasius*, which escaped our combined forces. The higher slopes teemed with local butterflies, of which we had already secured specimens. On my last day in Sicily, June 30th, I was charmed with a new brood of *podalirius* with abdomens suggestive of var. *zancleus*, on the lower slope of Monte Cicci.

On my way back to England I broke my railway journey at two places. First at Pracchia (between Florence and Bologna) in the Apeninnes, a grand butterfly locality, the lovely Apennine fields being very charming, and second at the Swiss frontier Iselle, for the purpose of walking over the Simplon Pass. The heat was intense at Iselle, and butterflies were common, including *apollo*, just outside the station. Seeing it for the first time the flight of some specimens struck me as very peculiar. They seemed to brush the herbage on the ground with their abdomens as they flew along, quite different to the flight of other butterflies, and it occurred to me that this may be the female's method of depositing her ova, in which action the horny pouch is of use. The Alps is by far the most prolific butterfly locality I have visited as regards species, but I need not enter into details, as numerous writers have already done so, except to say that I captured local forms of *galathea* at Berisal (5000 ft.) and at Brigne (2000 ft.) to compare with Sicilian, Calabrian, and Apennine forms. I reached home on July 8th with the heat-wave in full force.—J. PLATT BARRETT; "Westcroft," South Road, Forest Hill, London, S.E.

A PUBLIC BENEFACTOR.—Henry Watson Stockman, of Bolingbroke Grove, Wandsworth Common, was summoned before Mr. de Grey at the South-Western Police Court yesterday for damaging a growing tree on Putney Heath. The under-keeper said that he saw the defendant with a hammer knock off the bark of a birch-tree. He told the witness that he wanted to remove the caterpillars from their holes in the trees. Mr. de Grey: "Oh! he is a naturalist." The defendant: "Yes, sir. The keeper is quite ignorant of the damage done to trees by this particular kind of caterpillar." Mr. de Grey: "The authorities ought to be very much obliged to you, and you can go away. At the same time you must not do it again, for others may follow your example till there are no trees left." (Addressing the keeper), "You may not know, perhaps, but it is a fact that if this kind of caterpillar remains in the tree it would eventually destroy it." The summons was dismissed.—('Westminster Gazette,' Sept. 21st.)

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May* 23*rd*.—Mr. W. J. Kaye, F.E.S., Vice-President, in the chair. — Mr. H. W. Andrews exhibited specimens of the Dipteron *Brachyopa bicolor*, a Syrphid, from Bexley, with the Anthomyiid, *Hyctodesia scutellaris*, which it closely resembled.—Mr. Alfred Sich, specimens of *Ptycholoma lecheana*, bred on May 23rd from larvæ taken at Richmond on May 11th.—Mr. Cowham, a cocoon of *Dicranura bifida*, from which he had observed the imago emerge after softening a portion with a fluid which it had secreted. — Dr. Chapman, a larva of *Scolitantides orion*, in its first instar, mining between the cuticles of a leaf of *Sedum telephium*.—Mr. A. E. Gibbs, a large number of species of the genus *Cœnonympha*, and read notes on variation, characteristics, and distribution of the various species in the Palæarctic and Nearctic areas. — Mr. Kaye, the genus *Cœnonympha*, referring particularly to the large size and minute ocelli of the under sides in Irish specimens of *C. tiphon*. — Mr. R. Adkin, *C. tiphon* from English, Scotch, and Irish localities, and remarked on their general local characteristics, and *C. pamphilus*, referring to the varied development of the eye-spots.—Mr. Sheldon, fine series of the rarer species, *C. hera*, *C. œdippus*, and *C. iphioides*, and remarked on the unaccountable absence from Britain of the extremely common European species, *C. arcania*.—Mr. Curwen, long and varied series of *C. pamphilus* and *C. dorus*, and called attention to the occasional development of a row of submarginal spots on the fore wing.—Mr. Edwards, series of several species, including dark *C. arcania*, and species of the allied genus *Hypocistina* from Australia.—Mr. Turner, series of various Palæarctic and Nearctic species, including *C. elko* from Vancouver.—Hy. J. Turner (*Hon. Rep. Sec.*).

RECENT LITERATURE.

Polymorphism in a Group of Mimetic Butterflies of the Ethiopian Nymphaline Genus Pseudacræa.

Under the above title there appears in 'Nature' (Macmillan & Co.), for September 12th, Professor Poulton's latest contribution to a subject which exercises a peculiar fascination over the mind of the naturalist concerned with the interpretation of mimicry based on natural selection. Two years ago Dr. Karl Jordan communicated to the Entomological Congress at Brussels his studies of the male genital armature of the Pseudacræas, and deduced therefrom the specific identity of a large group made up of *P. eurytus*, L., and its numerous allies on the west coast of Africa, of Neave's *hobleyi*, *terra*, and *obscura* in Uganda, of Trimen's *rogersi* in Mombasa, and his *imitata* in Natal. As a further result this involved the remarkable conclusion that "the sexually dimorphic *P. hobleyi*, mimicking the sexually *dimorphic Planema macarista* in the Entebbe district, was the same species as the two *monomorphic* Pseudacræas flying in the same forests with it, viz. *P. terra*, and *P. obscura* mimicking respectively the sexually *monomorphic Planema tellus* and *P. paragea*.

This identity of species remained to be confirmed by a complete knowledge of the life-history of the species, and in this extremely interesting paper Professor Poulton now informs us that Dr. Carpenter, working in one of the islands of the Victoria Nyanza, has succeeded in breeding out from a female *obscura* "with a touch of *hobleyi*" the butterfly known as *terra*, Neave. This welcome and conclusive proof, however, was not forthcoming in time for Professor Poulton to convey it to the Oxford Congress, the cablegram with the single word "*terra*" from Entebbe arriving about a fortnight after the President's communication of "Messrs. C. A. Wiggins' and Dr. Carpenter's researches on mimicry in the forest butterflies of Uganda." But with this evidence before us we may now be sure that the cospecification of all the forms of the *hobleyi* group thereabouts will presently be confirmed, and this in such a way as to place beyond all doubt the genetic relationship subsisting between them. This means that quite twelve species sink as mimetic forms of one; and, as it may reasonably be doubted whether so remarkable a case will ever again be presented, we may echo Professor Poulton's congratulations to Dr. Jordan, Mr. Wiggins, Mr. Neave, and Dr. Carpenter on the parts they have played in solving a bionomic problem of extraordinary interest and complexity.

H. R.-B.

Proceedings of the South London Entomological and Natural History Society, 1911–12. Pp. i–xvi, 1–104, with four plates. Published by the Society, Hibernia Chambers, London Bridge, S.E.

The 'Proceedings' of this Society for the past Session contain an interesting Presidential Address by Mr. W. J. Kaye, F.E.S., dealing with the effect of last summer's abnormal temperatures upon the abundance or otherwise of insect-life, and also, shortly, with many very interesting facts connected with Mimicry, chiefly among Lepidoptera. We notice with regret that beyond a short but interesting paper by Mr. Lucas on "The Bracken," and some "Notes on the Season" by Mr. Adkin, there is a dearth of those papers which usually so greatly enhance the scientific value of the Society's publication. There is, however, a large mass of very interesting observations recorded in the Reports of the Meetings well worth perusal, and we must not forget the excellent Index.

N. D. R.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Vol. xi. By Sir George F. Hampson, Bart. London: Printed by Order of the Trustees. 1912.

The Euteliane, Stictopterinæ, Sarrothripinæ, and Acontianæ are treated in the present volume.

In the first subfamily there are one hundred and seventy-five species, and these are assigned to twelve genera, *Eutelia*, Hübn., and *Pæctes*, Hübn., receiving over one hundred species between them.

Eurhipia, Boisd. (t. *adulatrix*, Hb.), *Pencillaria*, Guen. (t. *ablatrix*, Guen.), *Eleale*, Walk. (t. *plusioides*, Walk.), *Ripogenus*, Grote (t. *pulcherrima*, Grote), *Phalga*, Moore (t. *sinuosa*, Moore), *Zobia*, Saalm. (t. *snelleni*, Saalm.), *Targallodes*, Holl. (t. *oculatrix*, Saalm.), *Silacida*, Swinh. (t. *inextricata*, Moore), *Atacira*, Swinh. (t. *approximata*, Walk.), and *Alotsa*, Swinh. (t. *discistriga*, Walk.), are all merged in *Eutelia*, Hübn. (t. *adulatrix*, Hübn.).

Thirty-four species are referred to *Stictoptera*, Guen. (t. *cuculloides*, Guen.), and thirty-five to *Lophoptera*, Guen. (t. *squammigera*, Guen.). The remainder of the species, forty-three in number, belonging to the second subfamily, are distributed among eight other genera, including *Stenosticta*, Hamp., a new genus, the type of which is *grisea*, sp. n., from British East Africa.

Sarrothripus, Curt. (t. *revayana*, Scop.) comprises only twenty-four of the three hundred and thirty species placed in the third subfamily. Of the other fifty-seven genera twenty-one are new, and as regards fifteen of them have been founded for single species.

In the fourth subfamily there are six species fewer than in the preceding, but the number of genera extends to seventy, of which at least sixteen are new. The largest genus appears to be *Carea*, Walk. (t. *varipes*, Walk.), with forty-five species, and next to this is *Earias*, Hübn. (t. *chlorana*, Linn.), with twenty-four species.

Altogether nine hundred and forty-one species are presented in this volume, which is the eighth of the series dealing with Noctuidæ. This brings the total number of species in this family so far considered up to something over seven thousand species.

An Atlas of eighteen beautiful plates accompanies the volume.

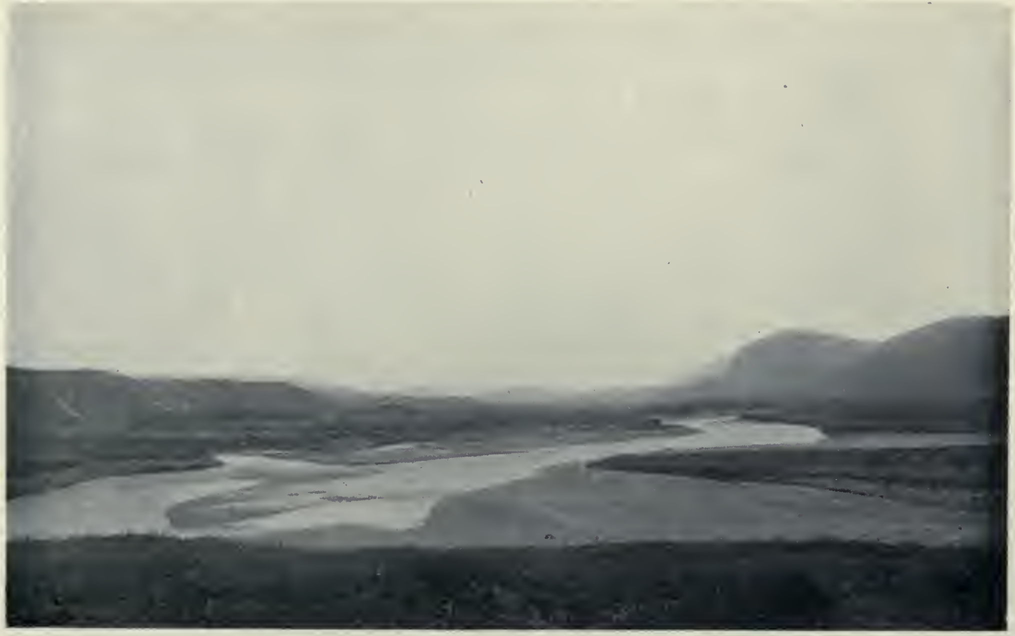

Photo W. G. Sheldon.

West, Newman proc.

VALLEY OF THE LAXELV.

THE HABITAT OF COLIAS HECLA.

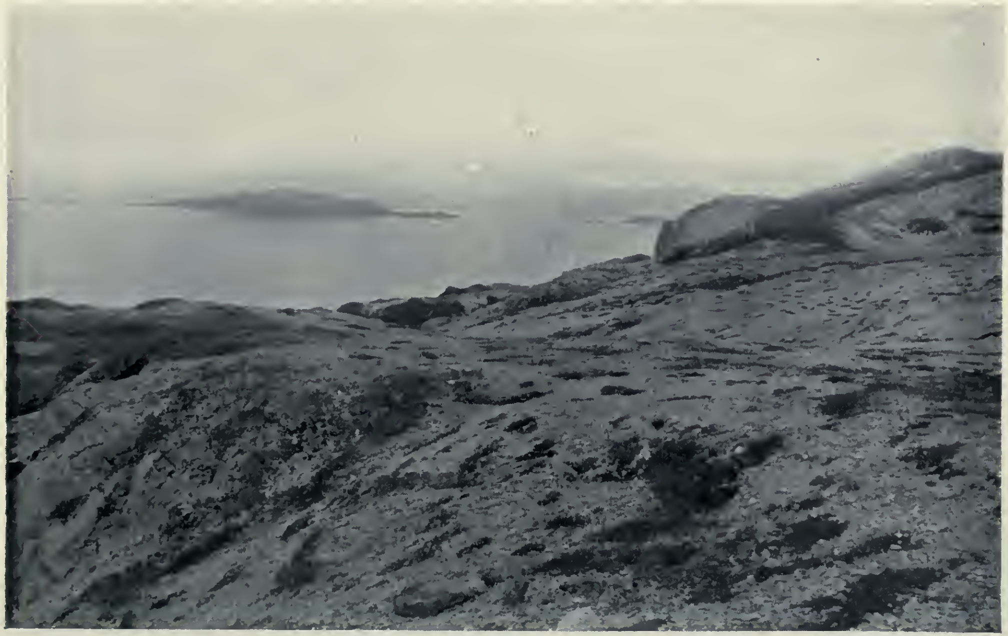

Photo W. G. Sheldon.

West, Newman proc.

DOLOMITE SCREES, KOLVIK, PORSANGER FJORD.

Where Brenthis polaris and Anarta zetterstedtii Fly.

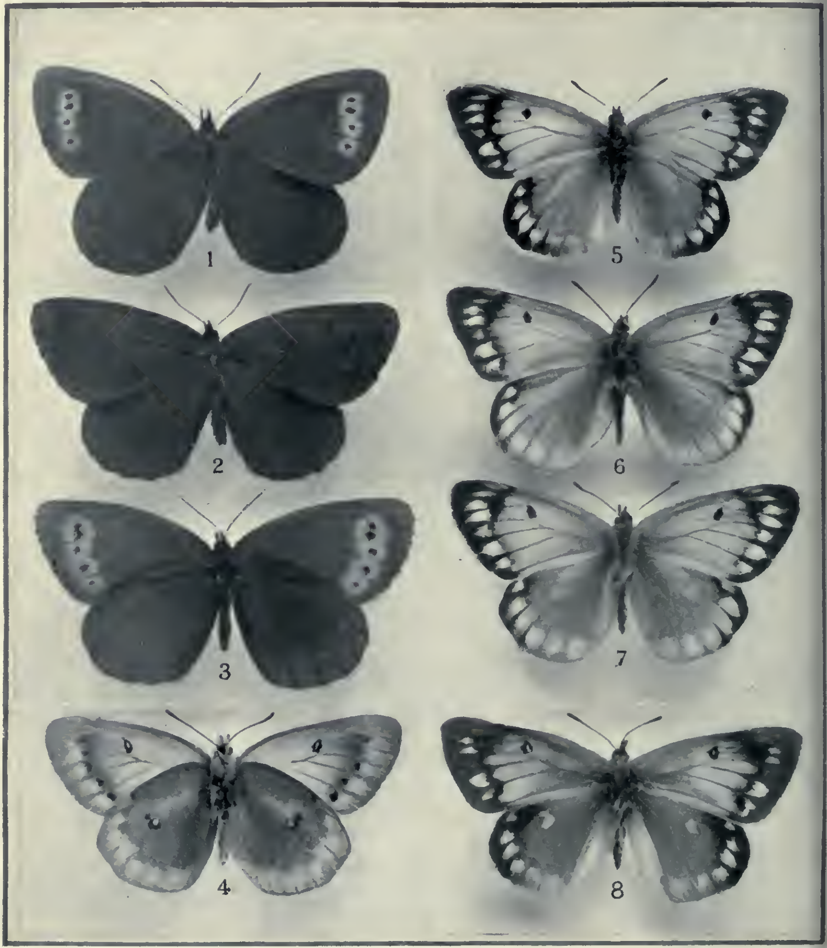

Photo H. Main. West, Newman proc

FORMS OF SCANDINAVIAN DIURNI.

Fig. 1.—*Erebia disa*, Thnbg., typical ♂. Bossekop, June 21st, 1912.
Fig. 2.—*E. disa*, Thnbg., ♂, ab. *obscura*. Bossekop, June 19th, 1912.
Fig. 3.—*E. disa*, Thnbg., ♀, ab. *addenda*. Bossekop, June 19th, 1912.
Fig. 4.—*Colias hecla* var. *sulitelma*, Aur.; ♀, under side. Laxelv, July 11th, 191
Fig. 5.—*C. hecla*, ♀, ab. *distincta* (dark border). Laxelv, July 11th, 1912.
Fig. 6.—*C. hecla*, ♀, ab. *ochrea-suffusa*. Laxelv, July 11th, 1912.
Fig. 7.—*C. hecla*, ♀, ab. *distincta* (light border). Laxelv, July 14th, 1912.
Fig. 8.—*C. hecla*, ♀, ab. *obscura*. Laxelv, July 11th, 1912.

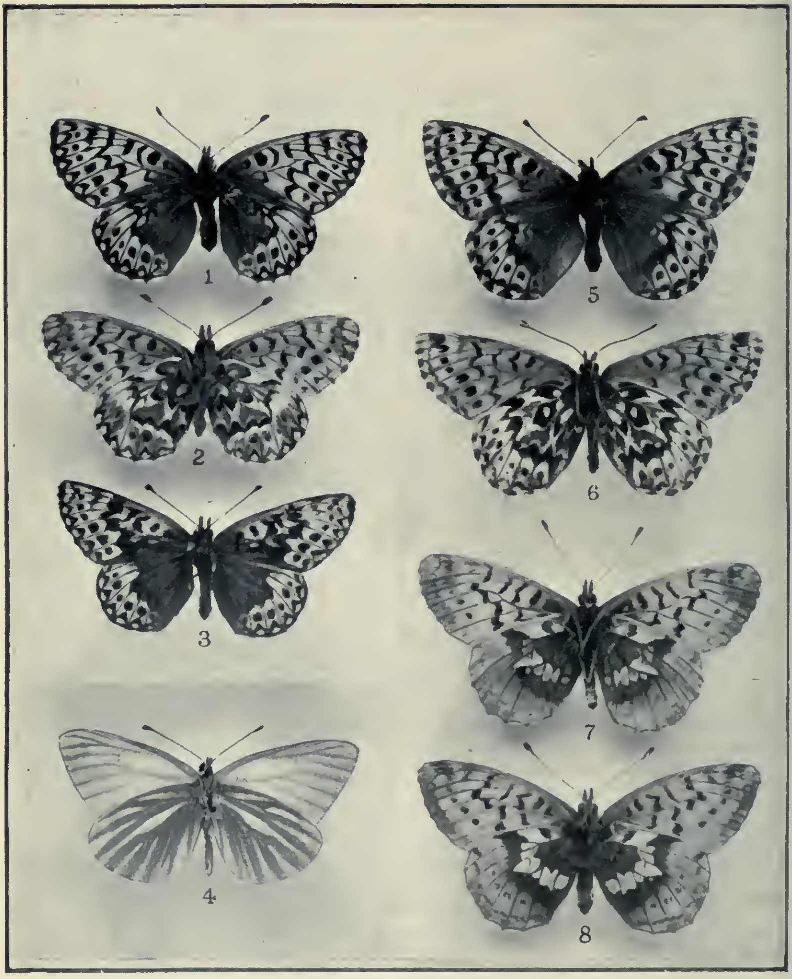

Photo H. Main. West, Newman proc.

FORMS OF SCANDINAVIAN DIURNI.

Fig. 1.—*Brenthis freija*, Thnbg., typical ♀. Abisko, June 25th, 1911.
Fig. 2.—*B. freija*, Thnbg., ♀ (under side), Abisko, June 18th, 1911.
Fig. 3.—*B. freija* ab. *fasciata*, ♂. Abisko, July 3rd, 1911.
Fig. 4.—*Pieris napi*, L., ab. *arctica*. Bossekop, June 19th, 1912.
Fig. 5.—*Brenthis polaris*, Bsd., ♀. Kolvik, June 28th, 1912.
Fig. 6.—*B. polaris*, ♀ (under side). Kolvik, July 3rd, 1912.
Fig. 7.—*B. frigga*, Thnbg., ♀. Laxelv, July 12th, 1912.
Fig. 8.—B. *frigga*, Thnbg., ♀. Jemtland, June 5th, 1911.

THE ENTOMOLOGIST

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THE LEPIDOPTERA OF THE NORWEGIAN PROVINCES OF ODALEN AND FINMARK.

BY W. G. SHELDON, F.E.S.

(PLATES XI.–XIV.)

THE expedition which I made into Scandinavia in 1911 (see 'Entomologist,' vol. xliv. p. 357) did not enable me to observe certain species of Diurni which then evaded my search; these included *Colias hecla*, *Erebia disa*, *Brenthis polaris*, *B. chariclea*, *Melitæa iduna*, and *Latiorina orbitulus* var. *aquilo*. The last four of these, so far as I am aware, have never been seen alive by my fellow-countrymen, whilst the only British record of *Erebia disa* I can find, is that Dr. Chapman took a few worn examples at Bossekop in 1896, and it was to get acquaintance with some at least of these species that I was, in part at any rate, induced to make another journey to the far north this year. I thought also, having worked out something of the life-history of *Colias nastes*, var. *werdandi* (see 'Entomologist,' vol. xlv. p. 122), I would like to try if I could not do something with that of the other purely Arctic species of this genus, *C. hecla*.

Of course there are many reasons why an expedition to Arctic Norway, to which district I decided this year to extend my operations, is one that has charms, apart from the Lepidoptera. The wonderful experience, perhaps unique throughout the world, of sailing for five days and nights, from Stavanger to the North Cape, through channels and fjords, passing thousands of islands, often approaching within a few feet of the precipitous shores towering many hundreds of feet above, the view continually changing the whole time; the beauty of the scenery, the great wealth of life continuously around one—birds, seals, and cetaceans—the bracing air, the perpetual daylight, and the charming Norwegian people, so honest, kindly, and obliging; all tend to impel one who has once been there to pay another visit.

I crossed over from Hull to Christiania on June 1st in the good ship 'Eskimo,' and, wishing to see something of certain southern Norwegian Lepidoptera, spent a few days in the neighbourhood of the well-known—to Lepidopterists—bog of

Disenæn, in the Province of Odalen. This bog has been worked by several British entomologists, and its fauna recorded. I could not find accommodation at Sæterstöen, where my predecessors had stayed, but I discovered a fair inn at Aarnes, the next station to Sæterstöen on the Christiania side, and a convenient train night and morning to convey me to my hunting-ground.

Being favoured with good sun on June 4th and 5th, I found plenty of butterflies. *Œneis jutta* was in great numbers and fine condition; the males one found at rest on the pine-trunks just on the edge of the bog, flying wildly therefrom when approached; females, less in number, were mostly disturbed from the ground. An hour or two amongst this species sufficed to obtain all I required. In the two days I managed to acquire half a score fine examples of *Hesperia centaureæ*; they frequented the edge of the bog, in clearings amongst the last trees. The other speciality of Disenæn, *Erebia embla*, I nearly missed, for I had expected to find it either out in the open, or amongst the last trees; but about an hour before the sun went in on June 5th I happened to cut across a thick belt of pine wood some fifty yards from the open, and here I found this fine species plentiful. As many examples as I required, some twenty in number, were quickly obtained; they included four var. *succulenta* and one var. *unicolor*. Of the other species seen, the most interesting was *Chrysophanus amphidamas*, of which I netted several worn examples on the railway bank between Sæterstöen and Disenæn, a few hundred yards from the former railway station. This is interesting, because Herr Sparre Schneider writes me that this species has never been taken in South Norway by Norwegians, only by Englishmen, and as the only account of its capture there by an Englishman that I can find is that of the one example recorded in 'Entomologist,' xxxi. p. 215, by Mr. R. S. Standen, the confirmation is satisfactory and conclusive. Amongst other butterflies seen were *Euchloë cardamines*, *Cœnonympha pamphilus*, *Hesperia malvæ*, *Pieris napi*, *Leptosia sinapis*, *Pararge hiera*, *Celastrina argiolus*, *Glaucopsyche cyllarus*, and *Rumicia phlæas*, all fairly plentiful on the railway bank. Females of *Brenthis freija* were busily ovipositing out in the open bog, yards away from anything but mosses and lichen. An interesting and an unusual sight to me was the number of *Hemaris tityus* (*bombyliformis*) that were flying over flowers of a species of *Vicia*, eight or ten examples being in sight at once.

I fear that the fine bog of Disenæn will soon be a thing of the past. It has at present an area of several hundred acres, and is crossed in the middle by the railway. On the north side the swamp is still in its pristine condition, but the southern half has deep dykes cut in it, and the surface at the time of my visit was being turned rapidly into arable land, and I apprehend, from what I heard at Aarnes, that the northern portion will follow suit very shortly.

On June 8th, the weather having temporarily broken up, I returned to Christiania, and calling upon the tourist agents respecting my passage to the far north, found I was confronted with a state of affairs which threatened to wreck my expedition at its outset. It appears there had been for some time dissatisfaction amongst the engine men on the Norwegian coasting steamers, and a strike of the whole of them was then imminent; the last steamer that would go north for an unknown period having left Bergen the previous evening. This was not a pleasant prospect and required consideration; but I finally decided to risk being stranded somewhere in the vicinity of the North Cape indefinitely, and taking the night express for Trondhjem, caught the Bergen steamer, the 'Richard With,' there early on the morning of June 9th, and sailed in her to Hammerfest, where we arrived in the small hours of the 12th.

Here the strike had taken effect, and the local steamers were all lying in a melancholy row in the harbour, with crews paid off, and fires raked out. For some time after my arrival I was nonplussed, and how to get to my destination, Bossekop, in the Alten Fjord, some fifty miles distant, I did not know. Fortunately I had heard whilst on board the 'Richard With' that there was a military station somewhere in the Alten Fjord, and coming across an army officer in the street, with whom I had travelled on the steamer from Trondhjem, I ventured to explain to him my dilemma, and my troubles were at once at an end for the time being, for this gentleman, who I afterwards found was the commander of the battalion in the Province of Finmarken, Oberstlöitenant Nyquist, with the kindness and obligingness which are inborn in a Norwegian, insisted that I should come as the guest of himself and a brother officer in a motor-boat they had chartered, and in which they were proceeding to Alten. We left Hammerfest about noon and reached Bossekop shortly before midnight, my hosts most kindly landing me there before proceeding to their destination. After some difficulty I got myself and my luggage to the small hotel, but the good people were gone to bed and I did not get any supper that night.

At Bossekop I remained until June 23rd, on which day, taking advantage of the presence of a cargo motor-boat, I prevailed upon the captain to allow me to travel in her back to Hammerfest.

Bossekop and the Alten Fjord are by far the best known localities for Lepidoptera in Arctic Norway. Zetterstedt was there in the first half of the last century, and in 1860 Drs. Staudinger and Wocke collected from May until August. A very complete account of the locality by Staudinger is to be found in the 'Entomologists' Annual' for the year 1864, and the record of captures is detailed in the 'Stettin Entomologische Zeitung,' 1861. In 1896 Dr. Chapman and Mr. Lloyd paid a visit, and in 1906 Mr. Rowland-Brown was there.

My chief reason for visiting Alten was to see a place so famous entomologically and botanically, for the flora for the latitude is very rich, but also I hoped to get specimens of *Colias hecla* and *Erebia disa*, both of which occur there. I did not see the former species, but was fortunate, after several days' search, to stumble across a locality in which the latter occurred in some abundance.

In the small hours of June 26th, the strike having by this time fortunately ended, I left Hammerfest on board the small forty-year old trading steamer 'Kong Eystein,' on what turned out to be the rolliest and yet the most enjoyable voyage I have ever made. We steered first north-west to the island of Soro, then north-east to Rolfso, Ingo, Hjelmso, and Maaso, going outside these islands and calling at innumerable quaint little fishing stations, dropping here a little cargo, or a few passengers, taking up there some dried fish, a horse, or a cow, or some hardy fisher folk on travel intent. At Hjelmso we passed close under a cliff haunted by millions of fowl of different species, and as the syren was sounded by the orders of the obliging captain for my edification, the air was darkened by their countless numbers. The swell of the Arctic Ocean, accentuated by the currents between the islands, made the little vessel rock fearfully and wonderfully, but she took the seas like a duck, and it was delightful to be on her deck amongst the marvellous surroundings the whole of the day.

About 9 p.m. we rounded that wonderful headland, the North Cape, where so many tourists go to see the midnight sun, and from which so few actually behold it, for this district is notorious for cloud and haze, even during midsummer. We steamed close under the gigantic cliffs, sheer and over one thousand feet in height, and passed Hornviken Bay into what is, in a sense, unknown Norway; that is to say, unknown to the tourist, who almost invariably stops at the North Cape, or who occasionally journeys in the large steamers through the Magerp Sound to Vadso, in the Varanger Fjord, where the voyage of these ships ends.

Baedeker is silent respecting the intervening fjords, and, except for a solitary traveller journeying at intervals of years up the Porsanger Fjord to Karasjok, the capital of Norwegian Lapland, which is situated some hundred miles in the interior, or an occasional salmon fisher, the only people are those who dwell on their shores.

The inhabitants are chiefly Lapps or Finns, or a mixture of these races, with a very few Norwegian families.

The Porsanger Fjord, which was the one I proposed to visit, is the one immediately east of the North Cape. It was discovered, entomologically, by the Norwegian lepidopterist, Herr W. M. Schöyen, who spent a considerable time there in 1878 and 1879. Since that date, except that his son, Herr T. Schöyen, visited the fjord in 1907, and Herr Sparre Schneider in 1907 and 1908, in which years, owing to bad seasons, the results were not good, I am not aware that anything has been done with the Lepidoptera.

In the early hours of June 27th the 'Kong Eystein' entered the quiet waters of the Porsanger Fjord, and a little before noon, on the west side, about half-way down, in a little haven known as Kolvik, I found a delightful place of rest. Kolvik is the headquarters of Herr A. Bye, the Porsanger Whiteley, who, in addition to selling everything the inhabitants of the district require, and buying everything they have to sell, runs an excellent private hotel, the frequenters of which are entirely his acquaintances and customers who may have occasion to pass up and down the fjord.

I spent a considerable time at Kolvik, making it my headquarters, and never was unintroduced foreigner welcomed with greater kindness, or more charmingly, than was the writer by Herr Bye, his family, and his guests.

The vegetation in the Porsanger is quite as luxurious, if not more so, than that of the much better known Alten Fjord. There is a great quantity of birch clothing the hillsides, which in sheltered places attains a height of thirty or even forty feet. With this is a sprinkling of mountain ash and black poplar. At the south end stunted Scotch firs begin to appear, and I am informed that a few miles further up country this tree attains a good size.

There is a very peculiar band of dolomite rock, several miles wide, which extends on both sides of the fjord, and which includes several islands. In all there are about one hundred islands scattered about, the resort of countless flocks of geese, duck, gulls, cormorants, divers, waders, &c., which resort to them to breed. Whales are frequent, and were seen on several occasions.

After remaining at Kolvik for a week, I took advantage of the visit of the local steamer to cross to Börselv, on the east side. The population of this village is entirely Lappish, and quarters were found at the postmaster's, who has a wooden house of two rooms, about twelve feet by eight feet, and six feet high, in one of which he and his family lived and cooked and slept; the other was the post-office, and this I occupied during my stay, sharing it during a portion of the time with another individual.

A quaint incident occurred here. I had noticed on arrival my host regarding me not altogether with approval; a little later on I found that the reason was that his only spare bedstead was but five feet six inches long over all, and, as it had raised solid wooden head and foot, it was obviously not a suitable place of repose for a man something over six feet in length! However, he was energetic and obliging, and during the evening the district was ransacked, with the result that shortly before midnight he was seen approaching, with a neighbour, bearing in triumph a bedstead of a size almost long enough to accommodate King Og of olden time, and in which I was installed with great ceremony in due course. It proved to be a very comfortable couch; in point of fact, I passed most of my time on it whilst at Börselv, for the weather at this period was the worst I have ever experienced in any country—an icy cold north-west gale blowing, with squalls of rain, almost the whole of my stay. I did eventually get a few hours of sun, during which, however, I could not find the particular species that was the chief reason of my visit—*Latiorina orbitulus*, var. *aquilo*, which Schöyen met with abundantly in 1879. With good weather, Börselv is a very desirable place to stay at, and I should, with these conditions, expect to find there most of the Diurni occurring in the district.

There is a good driving road from Kolvik to Laxelv, which is situated at the extreme southern end of the fjord, some thirty-five kilometres from the former place. On July 10th I hired a Lapp to drive me to Laxelv; the journey is vividly impressed on my memory by the eccentricities of the driver, who, after subjecting me to several hairbreadth escapes from disaster and the loss of my umbrella, succeeded in overturning the cart within one hundred yards of my destination. Fortunately I had not liked the appearance of that particular stretch of road, and did not happen to be in the cart just then, or my wanderings would most probably have come to an end—at any rate, for a time. All my luggage, except my boxes of specimens which I was carrying, was thrown out, and came within an ace of floating down the Elv, which was only a few feet away from the scene of the upset.

At Laxelv I found quarters with the schoolmaster, Herr Nilsen, whose house is romantically situated on an island formed by two branches of the river, birch-clad, but with glades and meadows of charming Arctic flowers, and in every respect a delightful retreat. From Herr Nilsen and his excellent Fru I received every kindness, and morning and afternoon there was always one of his numerous family of frank and friendly small children ready to ferry me across the Elv. It did not in the least matter whether it was a boy or a girl; they were equally efficient in piloting me safely across the turbulent waters.

Laxelv will always dwell vividly in my memory. It was here, on July 11th, I first saw that exquisite Arctic butterfly, *Colias* *hecla*, which was in such abundance that I selected over sixty perfect specimens in a few hours out of perhaps three times that number netted. It will be understood what a treat it was to a lepidopterist to see the swarms of this beautiful species, after a week of storm and rain, passed chiefly in a Lapp hut, with a diet of, for the most part, sweet coarse rye bread and goat-cheese.

My return journey to Kolvik, on July 17th, also nearly resulted in disaster, for at one of the two rivers which have to be crossed in a ferry-boat a cord slipped just as the cart containing the whole of my possessions was being got aboard, causing it to slide down the bank—which shelved rapidly—into the water and to come within an ace of being engulfed. By strenuous exertions, however, the driver and I managed to get my luggage out and placed in safety on the bank just in time.

(To be continued.)

THE GENUS *ITHYSIA* (HUBNER).

By J. W. H. Harrison, B.Sc.

As Mr. Prout has shown that the correct generic name of this group is *Ithysia*, I am adopting it in place of the more commonly used *Nyssia* (Dup.), which includes, in addition, the species I have included in my genus *Pœcilopsis*.

It was not my intention to supplement my notes on the Bistoninæ, published in the 'Entomologist' for July, 1910, until I had completed my work on the group, but I have been compelled by force of circumstances to publish the result of my investigations on this genus. As the genus now stands in our lists, it includes the three species, *Ithysia zonaria*, *I. alpina*, and *I. græcaria*, or, as we now call them, *Nyssia zonaria*, &c.; but I find that there are four species in the genus. These are:—

Ithysia zonaria (Schiff.).
I. alpina (Sulzer).
I. italica, sp. n.
I. græcaria (Bdv.–Staudinger).

To simplify the descriptions of the species it will be well to give here the scheme I have adopted in dealing with the various hybrids I have reared in this family.

I look upon the fore wings in the "ideal" species as being crossed by three transverse lines, which may or may not be obsolete in any given specimen. The first three, *viz.* first, median, and second, are dark coloured. The fourth or sub-terminal I look upon, for the sake of simplicity, as the white or pale band, which is generally followed or preceded by a strong blackish or brownish suffusion. The hind wings are much the same, except that the first line is only exceptionally present. Both wings have a white discal spot, surrounded by a blackish ring on the transverse vein. These spots may be absent.

I have previously suggested that *alpina* and *græcaria* should be separated from *zonaria*, but I am sure now that the separation, as far as *alpina* is concerned, was premature. This species I consider to be generically the same as *zonaria*. There are a few structural points, such as the stronger antennal pectinations and the absence of cornuti on the vesica in the genitalia, which might be used to separate the two species *italica* and *græcaria* from *Ithysia* under the generic name *Melanocoma*, but I prefer to call all four *Ithysia*.

The relation between the forms or species has been very obscure in the past, partly owing to the difficulty of obtaining them, and partly on account of their great variability. I hope that this paper will clear up this confusion. I shall deal with the males of each species separately, but for the purpose of comparison I shall treat of the females as a whole.

ITHYSIA ZONARIA (Schiff.).—This species has caused no confusion, as it is very widely distributed, being found throughout North and Central Europe, and extending even to Armenia. The type of the species, as found in Central Europe, has very dark markings—so dark, indeed, are they that they are nearly black. Our specimens (var. *britannica*, mihi) have much greyer markings, which tend to be obsolete inward from the præsubterminal suffusion.

In var. *rossica* (mihi), from the Ural Mountains, the specimens are very small, with strong dark markings and a line-like subterminal band.

For the British form, almost totally suffused with smoky black, I propose the name *obscura*.

I. ALPINA (Sulzer).—*I. alpina* was first described by Sulzer in 1776 from specimens taken in Switzerland, but when the plates were reissued by Roemer in 1789, he "emended" Sulzer's name to "*alpinaria*," and this name was used by Herrich-Schäffer in 1850, and Millière, in 1864, for the same species. In 1840, however, Boisduval described the species as *bombycaria*, and in this he was followed by De la Harpe in 1852. Guenée, too, used the same name.

Alpina is most readily differentiated from the others structurally by its very weakly pectinated antennæ. The pectinations themselves are exceedingly short, and at least six joints are without them, and those on the seventh are barely discernible. The ground colour of the wings is a slightly glossy white, very faintly speckled with brown in some specimens. The fore wings are traversed as usual by the three lines and the subterminal white band. All of the lines are thickened, more especially on the veins and before vein one. This thickening is especially marked on the median line, and extends for a space of 3 mm. at the costal end of the line. The directions of the first and median lines call for little comment, but that of the second line is exceedingly important. It proceeds from the inner margin, through the lower angle of the cell, to the fifth vein, and then proceeds with a sweeping curve almost the exact quadrant of a circle to the costa. In most specimens the median line is much nearer to the second line than to the first.

There is generally a white discal spot surrounded by a blackish ring. The subterminal white band has a strong brown-black suffusion before it, and a weaker one after. In a fair percentage of the specimens the terminal suffusion is absent, and then the insects assume a very different appearance. I call this form ab. *extincta*. The same type of markings holds on the hind wings, except that the first line is absent, and the median one nearly so. The discal spot and pupil are clearly marked on the hind wings. In all wings the veins tend to be outlined in dark fuscous. The termina of all are quite rounded, giving us a crescent of almost perfect shape as the outline of the fore wings, and a semicircle for that of the hind wings. The thorax is densely covered with almost white fur above, tending to brownish below, and the patagia may be outlined in brown. The body is dark brown, more or less densely covered with greyish hairs or fur. The genitalia are very simple, but are quite satisfactory, for they afford us excellent characters for separating the species. The valves are very short for the size of the insect, *i. e.* when compared with other members of the group. The upper margin is concave, whilst the lower is slightly so for five-sixths of its length, when we have a strong upward curve to the rounded tip, giving the valve roughly the outline of a pruning-knife. The costal ridge on the valve is wide, and is slightly raised.

The uncus is much the same as in the other species, except that the point is longer. The gnathos (the broad chin-like plate below the uncus) is wide, with a broad and slightly roughened tip, and is notched at the base. Its surface is squamous. The œdeagus is short and stout, whilst the vesica is provided with a few claw-like cornuti. The tergite of the eighth abdominal segment is slightly thickened, and is divided into two lobes.

I. ITALICA, sp. n.—This species has been assigned to both *alpina* and *græcaria* by various authors, a fact that seems strange until one is acquainted with the fact that very few of the older authors possessed all the forms. The first author who dealt with this form was Scriba ('Beitrage' iii. p. 215 (1793)), who imagined he was dealing with Sulzer's species, and used Roemer's emended name "*alpinaria*" for it. In this he was followed by Esper (Band v. Heft 9) in 1803, Hubner in 1796, and later by Duponchel. It is noteworthy that Esper's form was the darker form renamed *florentina* by Stefanelli in 1882, and treated by him as = *græcaria*, Boisduval–Staudinger. As *alpinaria*, Bork–Scriba, was the first form described and the name is invalid, I propose the name *italica* for the species.

The ground colour of *italica* is a somewhat glossy grey slightly mixed with light brown scales.

We have the usual four lines, but the first and median are only faintly marked except on the costa, where they are suffused. In the direction of the second line we have a most important character to distinguish this species from its congeners. All the lines start from the basal half of the inner margin and then strike very obliquely outward until vein one is reached. This point is perfectly reliable to separate *italica* in all its forms from *græcaria* and *alpina*. After vein one the first two lines go as in the other species. The second line, as in *alpina*, then strikes across the wing to the lower angle of the cell, and then, unlike that species, it continues parallel to the termen, which is not strongly curved near the costa. The median line is midway between the first and second line. None of the lines are thickened, but become darker as they cross the veins.

The subterminal band, owing to the weakness of the suffusions and the lines, is not so broad and rarely shows up so well as in *alpina*. The same differences are observable in the lines on the hind wings, but, owing to the difference in shape in the hind wings of the two species, both the median and second lines are nearer the base of the wings and are more parallel, with the result that very often the thickened second line crosses and obliterates the discal spot.

In shape the wings are very characteristic. The fore wings are markedly longer than the hind ones, and the termen is much less rounded than in *alpina*. In the hind wings, as the upper angle is much produced, the wings are much broader than in either *alpina* or *græcaria*.

The antennæ are markedly different from those of either *alpina* or *græcaria*, being very long and having very strong pectinations, which extend to the apex on the outer side, but are absent for the first four joints on the inner side. The pectinations, as well as being longer, are thicker and blacker than those of *græcaria*. The thorax is broad, and is covered with grey fur, whilst the abdomen is brown and is more or less covered with greyish hairs. The genitalia, too, are very distinct. The valves are much longer and broader than those of *alpina*. The upper margin is not concave, as in that species, but for about two-fifths of its length is straight. There is then a slight dip followed by a rapid outward curve. The outer margin is very slightly hollowed; then it turns upward, not with a bold curve, but with a slightly concave sweep until it reaches the downward curve of the upper margin. The costal ridge is narrow.

The point of the uncus is very short. The gnathos is much narrower than that of *alpina*, and instead of being indented at the base proceeds outward in a straight line until the curved extremity is reached. It is much more strongly squamous than in *alpina*. In general shape it is not unlike some forms of the shells of the genus *Pecten*. The œdeagus is short and stout, and the vesica is merely thickened where the cornuti ought to be, for they are absent. The eighth abdominal tergite is not thickened.

I. ITALICA var. FLORENTINA (Stef. nec GRÆCARIA, Bdv.-Staud.). —In this form the ground colour is strongly suffused with light brown, whilst the markings and suffusions are much stronger than in the type. The thorax is quite brown.

I. ITALICA var. CARNIOLICA, nov.—In this variety the ground colour is grey heavily suffused with blackish scales, whilst the markings and suffusions are colder in tone and much stronger than in the type. The thorax is dark grey.

I. GRÆCARIA (Bdv.-Staudinger).—This species was erected by Staudinger definitely in 1870, as Boisduval's name was without definite description, although proposed in 1840.

The ground colour of the wings is a dead grey, slightly mixed with yellow or brownish scales in the type, and in this deadness of the colour we have a contrast to the gloss of *alpina* and *italica*. The yellowness of the ground is stronger in the hind wings. On the fore wings the first, median and second lines are all present, as well as the subterminal band. The median line is very near the second one, which, at the fifth vein, takes a rapid inward sweep to strike the costa nearly at right angles. The subterminal white band has both of the usual suffusions, and is broader and less prone to be scalloped than in the other two species. The markings on the hind wings have the same characteristics. Both the suffusions and the lines on all the wings are more line-like than in the other species, and this character in the second line of the hind wings is very important. The veins are not outlined in black or brown.

The shape of the wings in this species is quite different from that of *alpina* and *italica*, for the fore wings, in proportion to the hind wings, are much shorter. In the hind wings the inner margin is not markedly less than the costal margin, so that the upper angle of the wing does not project as far as in *italica*, but is even rounded and turned in toward the base. The termen of the fore wings, too, is more rounded than in *italica*.

The thorax is grey, slightly brown mixed, and is not very broad, whilst the abdomen is brown with paler hairs. The antennæ are shorter than those of *italica*, and, while more strongly pectinated than those of *alpina*, are less strongly so than in *italica*. The pectinations, too, are thinner. The antennæ are not pectinated to the apex, for five joints possess no pectinations, whilst on the four before these, those on the inner side are much shorter than those on the outer side. The genitalia come next. The valves are of a totally different type to the others. They are much broader. The edges are parallel, the upper side being slightly hollow and the lower convex. Instead of having a tendency to being hooked at the extremity they are evenly rounded, like the end of one's middle finger. They are actually broader toward the end than in the middle. The costal ridge is very broad, and is scarcely defined.

The gnathos is broad, squamous and rounded, and more like that in *alpina* than that in *italica*, but it is only slightly indented, not notched at the base. The œdeagus is shorter and stouter than in *italica*, and, as in that species, the vesica lacks cornuti.

I. GRÆCARIA var. ISTRIANUS, Staudinger.—This form is much whiter than the type, and the markings are weaker generally, although variable in this respect.

The Females.

The female of *zonaria*, owing to the golden yellow bands, is readily separated from the others, although I possess an absolutely black female (ab. *nigra*) from Russia.

The females of the other three species, at first sight so much alike, are easy to distinguish after a little practice. In all, the bodies are black, more or less closely covered with white hairs. The rudimentary wings are white above, and are darker below. The tips and base are well supplied with strong white hairs.

Alpina is the easiest to separate, for sometimes the fur is yellowish, and, in all cases, the insect is more thickly covered with pale hairs. The great point of difference is, however, that the face and collar are white, whereas they are black in the others.

At first sight, to recognize the other two seems a difficult problem, but close examination soon removes the difficulty. The most obvious point of difference is that the thorax of *italica* is much broader than that of *græcaria*, and, like the rest of the body, is covered with fewer and shorter white hairs. The wings, too, are clearly less hairy, and, although in both species they are white above, in *italica* they are jet-black beneath, whereas in *græcaria* the under sides are blackish slightly mixed with whitish scales. The tips of the wings in *italica* are more pointed. The antennæ in *græcaria* are slender and the joints are well marked, but in *italica* they are thicker and the joints are masked by the close covering of scales. Compared with *græcaria*, *italica* possesses enormously stout and strong legs, and the difference is nowhere more definitely seen than in the femora and the tibiæ. However, the differences are better taken point by point, thus:—

italica.	*græcaria.*
Femora and tibiæ much broader, but less strongly scaled.	Femora and tibiæ weak.
Scales on legs all black.	Both white and black scales on legs.
Scales weakly toothed.	Scales strongly toothed.
Spurs ninepin-shaped, thick.	Spurs cone-shaped, not thick.
Femora somewhat regularly club-shaped.	Femora concave on upper edge.
Tibiæ weakly haired.	Tibiæ not strongly haired.

In the legs, *alpina* and *græcaria* resemble each other, but in *alpina* the femora and tibiæ are even weaker than in *græcaria*, although the scales are a trifle broader.

I shall now close my paper by giving a list of the localities whence the various forms I have described were received:—

I. zonaria. Central Europe.
    var. *britannica.* England.
    var. *rossica.* Ural Mountains.
    var. *obscura.* England.
I. alpina. Switzerland, Tyrol.
I. italica. N. Italy.
    var. *florentina.* Florence, Modena.
    var. *carniolica.* Carniola.
I. græcaria. Greece.
    var. *istrianus.* Carniola.

THE FEEDING HABITS OF SCORPION-FLIES (PANORPIDÆ).

By F. W. & H. Campion.

During the present year we made a few experiments with the object of discovering, for our own satisfaction, the kind of food consumed by scorpion-flies in their adult condition. At Ickenham, Middlesex, we obtained a living pair of *Panorpa communis* on May 19th, and placed them in separate glass-bottomed boxes. At 7 p.m. on the following day a live Aphid and a small live Muscid were introduced into the box containing the male *Panorpa*, and a live Aphid and a small *dead* Muscid into that holding the female. The next day, May 21st, the female was observed to be feeding on the dead Muscid. The male did not interfere at all with the living insects in its own box, but feeding soon took place when the dead Muscid, previously fed upon by the female, was offered to it. By nightfall on May 21st both the *Panorpa* were in a moribund condition, and were therefore killed off.

At Oxshott, Surrey, on May 29th, a male of *P. germanica* was enclosed in a box with a small living spider. Apparently, each arthropod was afraid of the other, and, as the *Panorpa* refused to feed, the spider was killed and replaced in the box. The scorpion-fly was then repeatedly observed to be feeding with manifest relish upon the dead spider, moving its wings and abdomen while doing so.

On May 31st a living micro-lepidopteron (probably *Catoptria ulicitana*) was presented to another male of *P. germanica*, also at Oxshott. Both insects were shy of each other, but, an hour after the moth had been killed and again presented, the *Panorpa* was found to be feeding, and its meal lasted fully half an hour. By that time the abdomen of the moth was entirely consumed. In this case feeding was not accompanied by movement of the wings or abdomen. Later on the same day a killed moth (*Bupalus piniaria*) was given to the *Panorpa*, but the scorpion-fly died without feeding having been observed.

Our observations tend to show, therefore, that, although the timid scorpion-flies are undoubtedly carnivorous insects, they feed upon dead animal matter, and do not catch and devour living prey. Mr. W. J. Lucas has also arrived at the conclusion that "it is perhaps established that in the imago stage they suck the juices of dead or injured animals, but do not hunt them down themselves" (Entom. xliii. p. 186 [1910]). It is not at all clear, however, whether adult Panorpidæ are really as short-lived as they appear to be, or whether, in a state of nature, they get nourishment at more frequent intervals than did the subjects of our experiments.

58, Ranelagh Road, Ealing: October 9th, 1912.

NOTES ON SEITZ'S 'MACRO-LEPIDOPTERA OF THE WORLD.'

By T. D. A. Cockerell.

I have just obtained Seitz's magnificent work, so far as published to date, and am truly astonished at its excellence and cheapness. It is a great privilege to be living at the time of publication of such a book. Going through the several parts I have noted a few things which may be of interest; relatively trifling matters, but perhaps deserving notice at this time.

Pieris brassicæ var. *obscurata* is nearly the same as var. *nigrescens* (Entom. xxii. p. 55), which is based on the form from near Perth described by Newman and in Entom. iv. p. 258. The original publication of the name *nigrescens* is hardly sufficiently explicit.

Anthocharis cardamines var. *minor* (Entom. xxii. p. 176) is not *turritis*, but is the dwarfed form (*hesperidis*). The name *minor* has priority. The form of the male with yellow instead of orange tips is *aureoflavescens* (Entom. xxi. p. 189; Entom. Amer. v. p. 34).

Colias hyale var. *pallida* was originally applied by Robson and Gardner (and also in Entom. xxii. pp. 4, 56) to the light form of the female, properly the typical form. The variety *pallida*, Tutt, may be named *pallidior*.

C. electo var. *aurivillius* is the same as var. *pallida* (Entom. xxii. p. 5).

C. wiskotti alexandra, Stgr., if a subspecies, is unfortunately named, since there is an American species with the same name.

C. edwardsii is not from Virginia. The white female of *C. philodice* was named, long ago, *pallidice*, Scudd., *alba*, Maynard (*cf.* Entom. xxii. p. 5). Similarly the white female of *C. eurytheme* has earlier names, one of which is *pallida* (West Amer. Sci. 1887, p. 217); see also Scudder's 'Butterflies of New England' for full details.

C. (*Meganostoma*) *cesonia* var. *rosea*, Stgr., appears from Skinner's catalogue to be preoccupied by var. *rosea*, McNeill, 1889; but McNeill wrote *rosa*.

C. croceus var. *poveli* is *pseudomas* (Entom. xxii. p. 26), and the later *obsoleta*, Tutt.

C. croceus var. *pyrenaica* is probably *minor* (Entom. xxii. p. 176). The ab. *cærulea* is evidently close to *purpurascens* (Entom. xxii. p. 3).

Neophasia princetonia is from Arizona, not from Illinois.

Epinephele tithonus vars. *subalbida*, Verity, and *albida*, Russel, are *pallescens* and *albidus*, Entom. xxii. p. 3, but there rather insufficiently indicated. For *pallescens* see also Entom. xix. p. 230.

Pyrameis cardui var. *minor*, Canad. Entom. 1890, p. 57; Ent. Rec. 1890, p. 60, appears to have priority over var. *minor*, Cann.

Limenitis camilla var. *nigrina* = *nigra*, Entom. xxii. p. 54, the first doubtless earlier. See also *nigra*, Mosl. 1886, without description. The ab. *obliterata*, Shipp, is doubtless the one named *obliterata*, Robs. & Gard.

Chrysophanus phlæas var. *fasciata*, Ckll. (Entom. xxii. p. 99) is the banded form; var. *fasciata*, Streck., is the corresponding variety of the American race (*hypophlæas*).

Zygæna filipendulæ ab. *flava* = *cerinus*, Robs. & Gard. *Z. lavandulæ* has a yellow ab. *lutesens* (Entom. xxii. p. 128).

Spilosoma urticæ ab. *radiata* was perhaps first named in Entom. xxii. p. 147.

Arctia caia ab. *lutescens*, credited to Tutt, appears to have been first named in Entom., June, 1887, pp. 150–152.

NOTES AND OBSERVATIONS.

Papilio dardanus var. Leighi, and Danais chrysippus-dorippus in Natal.—By a slip of the pen in our note on Professor Poulton's remarks in 'Nature' on "Polymorphism in a Group of Mimetic Butterflies" (*antea*, p. 271), we mentioned the assistance given the author by "the late" Mr. C. F. Leigh. We had in mind the late Mr. A. D. Millar, of Durban, and offer our apologies to Mr. Leigh, whose many friends in this country will be glad to hear that not only is he alive and well, but that he is continuing his successful breeding experiments. Under date, September 28th, he writes that "he bred on September 25th the finest example of the *leighi* form of the *Papilio dardanus* that he has yet reared. This specimen—the seventh known to exist—was reared from ova obtained from a variety of the *trophimus* form of the female, and is now in the collection of Mr. D. Longsdon, of London." Mr. Leigh also asks us to announce the occurrence of the *dorippus* form of the female of *Danais chrysippus* in some numbers in and near Durban this season, after not being seen for some years.—(H. R.-B.)

Apparent Autumnal Migration of Pyrameis atalanta.—During the middle and latter part of September, when the settled weather for which we had looked so long came at last, a number of *Pyrameis atalanta* frequented a long bed of China asters in my garden. An attempt by my boy to catch one resulted in a torn hind wing, which served to identify the individual. On the look-out for the particular insect thus marked, I noticed an apparent migration of the butterflies. Thus on September 12th there were two, one with a torn hind wing; on September 13th three; on September 16th the torn one had disappeared, leaving two; on September 17th there were three again, but the torn one was not among them. On the 19th there were three, and one of these had again a torn hind wing, but this was not the same insect that had been previously noted, as the opposite wing was damaged. In two days this also had disappeared. On the following few days four butterflies were seen, but none of them had an injured wing. Then they were reduced to three, increased to four again, reduced to two, and finally disappeared altogether early in October. It seemed, therefore, that a migration was going on which the occurrence of two injured insects enabled one to follow.—(Rev.) W. G. Whittingham; Knighton Vicarage, Leicester.

Occurrence of Second Broods of Pyrameis atalanta and P. cardui.—In reference to Mr. Carter's note on the abundance of *P. atalanta* larvæ this season in Kent (*antea*, p. 299), I may state that larvæ of this species also occurred very abundantly in this district in June. Some hundred that I collected were full-fed by the beginning of July, and every individual produced a butterfly later. Imagines commenced to emerge July 18th, and by this time larvæ had disappeared from the nettle-beds in the lanes; they were not in evidence again until about September 14th, when they commenced to appear, and by the beginning of October were quite as abundant as in June. At the time of writing this note I have larvæ as small as a quarter of an inch in length, while others are preparing to pupate. I am quite sure from my own experience that there is a second brood of *P. atalanta*, at least of larvæ, every year, as I have found them in October for the past four years; but in my opinion very few of these late larvæ survive in a state of nature. Two years ago I made experiments with some of these late larvæ. Some were fed in a cage in the open air, and others in an unheated room. Every one of those under the latter conditions fed up and pupated, and the imagines appeared in due course, the last one emerging as late as the end of November; all were exceptionally fine specimens. The larvæ kept out of doors fed much slower, and most of them shrivelled up, as Mr. Carter states happened to those he had. Of the few that did pupate, the imagines formed in every case, but only two emerged, and the wings of these were so deformed as to be useless for flight. The occurrence of *P. cardui* was almost identical with that of *P. atalanta*, excepting that *P. cardui* was not so abundant; larvæ occurred in June, and produced imagines in July, and larvæ again appeared in September. My latest record is of six larvæ, half an inch in length, taken October 9th. It seems natural for these two species of butterfly to go on reproducing their kind and not to hibernate in any stage, so that were it not for the periodical arrival of immigrants, the species would soon become extinct in this country, as the larvæ seem unable to survive the cold. I believe there is no authentic record of either *P. atalanta* or *P. cardui* having been found in hibernation in this country, and the fresh condition of specimens seen in the spring could hardly be possible if they had weathered the vagaries of our English winter.—A. T. POSTANS; Southsea, Portsmouth, October 14th, 1912.

ANARTA MYRTILLI REARED IN JULY FROM JUNE LARVÆ.—I do not know if the following is worth recording. On June 17th I obtained locally twelve larvæ of *A. myrtilli*—some full-fed, others about half-grown. Moths emerged from seven pupæ about the end of July, and yesterday (Oct. 14th) another emerged, whilst the other four are still in the pupal stage. It seems to me that this species must be double-brooded, although I believe most books state that the imago flies in May. There can be no doubt, I think, that the full-fed larvæ I had were from parents which emerged in May, and the fact that seven out of twelve emerged at the end of July really seems to point to the fact that in nature the insect is double-brooded. I shall be interested to notice how the remaining four pupæ fare. What is your opinion on the matter?—G. TALBOT THORNE; 53, Acland Road, Bournemouth, October 15th, 1912.

[It is quite conceivable that, even in the open, *A. myrtilli* may in certain favourable seasons pass through two life cycles during the year. Mr. Thorne's interesting observation is evidence that the species can do this in confinement. The statement has been made that the late as well as the early specimens seen in the same year are alike individuals of one generation, but it would seem to be more probable that specimens on the wing after July are the offspring of parents which were flying in the late spring or early summer of the year. Mr. Thorne notes that he still has four pupæ from the June larvæ. Possibly moths from these may not emerge until next year, and, if so, this fact would seem to indicate that *A. myrtilli* does not usually attain the imago state twice in the year, although when conditions are suitable it may do so. At the same time it continues to be, in part at least, a one cycle species.—Ed.]

Late Emergence of Apatura iris.—In the February number of the 'Entomologist' (*antea*, p. 79) I reported the emergence of a specimen of *Apatura iris* as a second brood. The other larvæ, with one exception, fed up in a normal manner, the perfect insects emerging last July. One lagged behind the others, and by the time they had pupated it was only about one-third grown. Eventually it changed to a chrysalis on September 1st, and the imago—a very small female—emerged on October 2nd.—Edward Goodwin; Canon Court, Wateringbury, Maidstone, October 4th, 1912.

Pyrameis atalanta, ab.—On Sept. 6th my little son captured a fine variety of the above-named butterfly in the rectory garden here. The normal red of the bands on the hind wings is replaced by yellow for a third of the length on the left side, and two-thirds on the right. South, in 'The Butterflies of the British Isles,' p. 81, records that "a specimen with the bands of hind wings marked with yellow has been noted," but I have been unable to trace the reference.—(Rev.) Alfred T. Stiff; Grantham, Victor Drive, Leigh-on-Sea, Essex.

Leucania unipuncta in Isle of Wight.—On Sept. 7th last, whilst sugaring in the Isle of Wight I took what seemed to be a very unusual looking *L. lithargyria*. By the light of day next morning I was convinced that I had something much better than that common object of the country, and I now find that my capture was a very fine male *L. unipuncta* (*extranea*). It was taken at sugar about 8 p.m. on a dull cold night when very few other insects were about.—D. Dewar; Altyre House, Stanley, R.S.O., Co. Durham, October 21st, 1912.

Dasypolia templi in Lincolnshire.—I took a specimen of *Dasypolia templi* at rest on a gas-lamp on the evening of October 10th. This is the first authentic record of its occurrence in Lincolnshire.—G. W. Mason; Barton-on-Humber.

Tortrix pronubana, Hb.—About the middle of last month I paid a short visit to the spot where the late Mr. G. H. Conquest found *T. pronubana* last year, and having secured the few larvæ and pupæ I required to enable me to complete my own short series and that of a friend, I thought I would see what other food-plants I could find it on. All the above, it should be stated, were on *Euonymus japonicus*. I found, after a long search, two pupæ in spun-together privet-leaves, and one on *Robinia pseudacacia*; in this last instance the larva had spun the last pair of leaflets to the terminal one, forming a covering of a rough triangular outline. Although *Robinia* is well known abroad as one of its very numerous food-plants, I am not aware that the larva of *T. pronubana* has been found on it in this country before. The insect is well established in that part of Essex, and I am quite prepared to find it on *this* side of the county at any time. It seems perfectly marvellous how this pretty moth has spread about in the past six or seven years, for so conspicuous an insect is hardly likely to have eluded entomological eyes for any length of time previously. It might be of interest to mention that I found larvæ, pupæ, and imagines (two males) on the same day.—A. THURNALL; Wanstead, Essex, October 1st, 1912.

RETINIA (RHYACIONIA) PURDEYI IN NORFOLK.—The Rev. W. G. Whittingham has very kindly given me two specimens of the *Retinia* mentioned in his article (*antea*, p. 295). These I find are referable to *R. purdeyi*, Durrant, a species quite recently described from specimens captured by Mr. W. Purdey at Folkestone, in Kent, about the third week in July, 1911. The Norfolk specimens were netted, as they flew about pine-trees, in the afternoon of August 20th last.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

ARCTIC DRAGONFLIES.—Mr. W. G. Sheldon was good enough to give me three dragonflies which he took this summer beyond the North Cape—one male *Æschna cærulea* (= *borealis*) and two male *Somatochlora alpestris*. The former occurs, not commonly, in the Highlands of Scotland; the latter is not British, but is found in Switzerland. All the specimens Mr. Sheldon saw were at about sea-level in that latitude. *Somatochlora alpestris* was generally distributed in the Porsanger Fjord wherever there were pools of water. The first specimen was taken at Kolvik on June 27th, and several others of this species were seen there during the ensuing week. At Laxelv, at the southern extremity of this fjord, it was quite common, probably because there were here many pieces of stagnant water. Mr. Sheldon saw examples also at Kistraud on the west and at Börselv on the east side of the fjord. *Æ. cærulea* he saw only at Laxelv—perhaps half a dozen examples in all. They were very wary, and the specimen he gave me was the only one he got a chance at; it was taken on July 13th. He did not see any Odonata at Bossekop, in the Alten Fjord, where he stayed from June 12th to June 28th, nor at Abisko, in Swedish Lapland, at which place he spent from June 16th to July 18th, 1911, although he kept a sharp look-out for them at both these places.—W. J. LUCAS; Kingston-on-Thames.

TÆNIORHYNCHUS RICHIARDII, Fic., IN MIDDLESEX AND HAMPSHIRE.—Two new records can now be added to the short list cited by Mr. F. W. Edwards for this uncommon British mosquito (*antea*, p. 261). That gentleman has been good enough to identify two females collected by myself at Ealing on July 12th and 26th, 1912, respectively. He has also shown me a female which he took at Hook, Hants, on the 17th of the same month, and has kindly permitted me to publish his record with my own.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, September 25th, 1912.

FURTHER RECORDS OF COLIAS EDUSA IN ENGLAND.—On August 28th, at Reading, I captured one male *C. edusa*, and next day saw a female but failed to secure it.—DOUGLAS H. BUTLER; 293, Oxford Road, Reading.

Colias edusa appeared in limited numbers in the clover fields around Chichester on sunny days during July and August. The first specimen, a female, was taken by Mr. Gilbert Humphry on July 24th. —JOSEPH ANDERSON; Alre Villa, Chichester.

Panorpa cognata in Surrey.—On July 4th, 1903, Mr. R. South took at Ockham, Surrey, a male scorpion-fly, which he believed to belong to the scarce species *Panorpa cognata*, Ramb. Mr. K. J. Morton has now been kind enough to examine the specimen, and he informs us that the identification is correct. A female taken by Mr. W. J. Lucas at Byfleet, in the same county, on July 23rd, 1904, has been already recorded (Entom. xliii. p. 187 (1910)).—F. W. and H. Campion; 58, Ranelagh Road, Ealing, October 9th, 1912.

Note on Pyrameis cardui.—On July 2nd, at St. Leonard's-on-Sea, I found several dozen larvæ of *P. cardui*. At the same time worn specimens of the butterfly were on the wing. On July 7th several of the larvæ had pupated; two imagines emerged July 19th and the last emerged July 29th. One specimen has a white spot in the red portion of the wing, two have an additional white spot in the apical region of the fore wing, as mentioned in Barrett's 'Lepidoptera,' and one has a black spot in the red portion of the wing.—W. E. Butler; Hayling House, Oxford Road, Reading, October 16th, 1912.

SOCIETIES.

Entomological Society of London. — *Wednesday, May 1st*, 1912.—Mr. A. H. Jones, Vice-President, in the chair. — The Rev. E. Adrian Woodruffe-Peacock, F.L.S., F.G.S., Cadney Vicarage, Brigg, Lincolnshire, was elected a Fellow of the Society.—Mr. A. H. Jones exhibited three examples of *Aglais urticæ* var. *ichnusa* showing the absence of scales in the centre of the wings, where the central spots are present in the type. Also examples of *Euchloë damone* from Asia Minor and Sicily, showing the difference in the depth of colour of the transverse black streak on fore wings and in the tone of colour of under sides.—Dr. G. B. Longstaff, a series of twelve specimens (five males and seven females) of the rare white butterfly, *Pinacopteryx doxo*, Godart (*venatus*, Butler), from the White Nile. — Mr. Alfred Sich, two specimens, with their cases, of *Coleophora trigeminella*, Fuchs, and one specimen of *C. badiipennella*, Dup., with its case for comparison. — Mr. W. J. Kaye, three small groups of Ithomiine butterflies that had been taken by himself in S. Brazil. — Mr. Hamilton H. Druce, male and female of the new *Mimacræa eltringhami*, captured by Mr. S. A. Neave in the Bugoma Forest, Unyoro, Uganda; also another new *Mimacræa*, which he proposed to name *costleyi*, after its discoverer Mr. Costley-White, at Mlanji, Nyasaland, which appeared to be allied to *M. marshalli*, Trimen, a specimen of which was also shown for comparison. Mr. S. A. Neave described the capture of these specimens. This species in common with several others flies very high, and he said that it was often necessary to employ small native boys perched at the top of the trees and armed with nets.—Mr. A. E. Gibbs exhibited a drawer of butterflies received from Dr. Davis, of Belize, collected in British Honduras and the neighbouring Republic of Guatemala.—Mr. C. B. Williams, a specimen of the male *Megalothrips nobilis*, Bagnall, from Wicken Fen, taken April 11th, 1912. This is the largest European species, and, since first taken by Dr. Sharp in 1894, has not been recorded.—Mr. S. A. Neave, some of the Tabanidæ collected during his recent tour in East Africa, on behalf of the Entomological Research Committee of the Colonial Office. He called attention to the male individuals exhibited, and expressed the opinion that their rarity in collections was perhaps due to the fact that they were short-lived. Mr. G. A. K. Marshall observed that probably many of the Fellows present would hardly realize the importance of Mr. Neave's exhibit. Even amongst the English Tabanidæ by no means all the males were known, and this sex was hitherto unknown in the large majority of the species then exhibited. — Mr. R. M. Prideaux brought for exhibition seventeen ova of *G. rhamni* found in a cluster at Brasted Chart, on April 28th, on a shoot of *Rhamnus frangula*.—Professor Poulton said that he had long been struck, especially in the collections of butterflies received from Uganda and British East Africa, with the immense development of mimicry in Lepidoptera from the forest as compared with the open country. It occurred to him that probably this difference was to be accounted for by the difference between the insect-eating animals in these two types of locality, lizards being probably the great vertebrate insect-eaters of the open, birds of the forest. Mr. S. A. Neave said that he had recently had an interesting experience near Entebbe. On January 12th, 1912, at Gabunga's, near Entebbe, he had watched a wagtail, most probably *Motacilla capensis*, catching butterflies on a small patch of damp sand in the bed of a forest stream. The bird was so tame that he stood within three or four yards of it. In less than half an hour this bird captured and ate nineteen butterflies and failed to catch many others. The butterflies eaten were nearly all small Lycænids. — Professor Poulton drew attention to a few observations which supported the conclusion that birds possessed the extraordinarily acute and far-reaching vision required by the Batesian and Müllerian theories of mimicry.—The following paper was read: "On the Colour Groups of the Hawaiian Wasps," by Dr. R. C. L. Perkins, M.A., D.Sc., F.Z.S., F.E.S. In illustration of the paper, Prof. Poulton exhibited the specimens referred to by Dr. Perkins. The colour-groups were arranged in the order of the islands, from Kauai in the north-west to Hawaii in the south-east.

Wednesday, June 5th, 1912. — The Rev. F. D. Morice, M.A., President, in the chair. — Mr. Henry Francis Carter, Assistant Lecturer and Demonstrator in Medical and Economic Entomology, Liverpool School of Tropical Medicine, University of Liverpool, was elected a Fellow of the Society. — The President announced that it was requested that for the future the names of intending exhibitors should be handed in at the beginning of the meeting, in order that they might be called upon from the chair.—The Rev. G. Wheeler read the following report of the Committee on Nomenclature:—"The Committee appointed on April 3rd, 1912, to consider the subject of nomenclature, and report to the June meeting with a view to the coming International Congress, has endeavoured to deal carefully and minutely with the matter entrusted by you to its attention. In accordance with the powers conferred on members by resolution of the Society, they added Mr. L. B. Prout to their number after their first meeting. Your Committee probably thus represented almost every form of divergent opinion on the subject of nomenclature, but nevertheless arrived at a unanimous report which they recommend to the Society for presentation to the International Congress. It will be evident that if these recommendations are adopted by the Society, and the suggestions of the Society by the International Congress, an opportunity will be afforded for putting before the International Committee the different views on matters of detail held by the members of your Committee, or by any other entomologists." The report, which is signed by every member of the Committee, is as follows:—"The present independent and irresponsible methods of giving and adopting names having resulted in much unnecessary synonymy, and even graver abuses, the Entomological Society of London feels that the time has arrived when some check should be placed upon the practice, of more weight than that which can be exercised by any single individual, society, or publication, and would urge upon the International Congress the establishment of a permanent International Committee to deal with questions of nomenclature as affecting Entomology; to consider what elucidations, extensions or emendations, if any, are required in the International Code, and to confer with the International Commission of Zoological Nomenclature. The Entomological Society of London recommends that the International Entomological Committee, when formed, shall take such action as to ensure the adequate representation of Entomology on the International Zoological Commission. The Society also recommends that, considering the difficulty of frequent International meetings, the leading Entomological Society of each country be invited to appoint a Committee, whose duty it shall be to deal with all questions arising in their own country, subject to reference to the International Committee; and suggests that the International Committee be composed of two, or three, members of each of the National Committees, elected either by the Committees, or directly by the electing Societies. (Signed) Chas. O. Waterhouse, Chairman; G. T. Bethune-Baker, T. A. Chapman, Jno. Hartley Durrant, Louis B. Prout, Hy. J. Turner, George Wheeler." The report was adopted.—Mr. J. E. Collin exhibited a series of thirteen specimens of *Physocephala nigra*, De G., the largest British species of the Conopidæ, caught on Studland Heath (Dorsetshire) during the last week in May, when Colonel Yerbury, Mr. C. J. Wainwright, and himself took some twenty-four specimens; though widely distributed, the species was always considered a great rarity, and its occurrence in such numbers had never before been recorded. — Dr. T. A. Chapman, a specimen of *Hydræcia burrowsi*, Chpn., a new species that has turned up (from Vladivostock) since Mr. Burrows's paper on the group; also a specimen of *L.* (*Albulina*) *pheretes*, female, bred at Reigate from the egg, supposed to be the first (and only) bred specimen of the species.—Dr. G. B. Longstaff, two uncommon Sudanese butterflies, *Calopieris eulimene* and *Teracolus pleione*.—Mr. S. A. Neave, some specimens of the Asilid genus *Hyperechia*, representing three, perhaps four, species, all taken during his recent tour in East Africa; also, for comparison, four common species of *Xylocopa*, bees to which the flies bore a marked superficial resemblance; also a remarkable new nymphaline butterfly, probably belonging to the genus *Pseudacræa*, taken on Mt. Mlanji. Nyasaland. He pointed out that it bore a marvellous superficial resemblance to *Amauris lobengula whytei*, Butler, the Danaine which occurred in the same place. He further exhibited a number of unnamed Lycænids, principally from Uganda.—Mr. H. Main, series of *Pieris napi* and var. *bryoniæ*, and pointed out that the latter, reared from ova received both from Lapland and Switzerland, had produced a partial second brood.—Mr. K. G. Blair, larvæ of *Cebrio* sp. (? *gigas*) from Sicily, received from Mr. J. P. Barrett.—Prof. Poulton, the females of two families of *Hypolimnas misippus*, reared in 1911, from female parents of the type form, by Rev. K. St. Aubyn Rogers, M.A., F.E.S., which confirmed the conclusions drawn from his earlier work that *misippus* was dominant and *inaria* recessive. Also the fragments of a *Glossina* identified by Mr. E. E. Austen as a female of *G. caliginea*, Aust.; the specimen had been bitten and rejected by a monkey. He also exhibited several families of butterflies bred by Mr. W. A. Lamborn in the Lagos district, and referred to the strong light which was thrown by them upon different biological problems. Also a specimen of the Eupterotid, or, as Aurivillius considers, the Notodontid moth, *Anaphe infracta*, concerning which Mr. W. A. Lamborn had written from Oni Camp, April 22nd, 1912:—"The moths undoubtedly possess urticating hairs. The female Mona was allowed to steal one. She smelt it, rubbed off the hairs and scales, then dropped it and in a few minutes was rubbing all four feet on the ground. I made some sympathizing remarks with the result that she suddenly sprang on to my bare neck and I have been troubled with skin irritation all the evening." Prof. Poulton said that Mr. A. Hamm had found hairs from the anal tuft of the exhibited specimen produced irritation on his hand and face. Mr. Eltringham had found that the hairs of the female but not of the male tuft were covered with minute, excessively fine spicula-like teeth. Prof. Poulton also exhibited the imagines and cocoons of *Chrysopsycha varia* sent to him by Dr. G. D. H. Carpenter from Damba Island. The larval skin was still projecting from some of the cocoons and showing its blue spots.—Dr. T. A. Chapman remarked that the hairs covering the eggs of *Porthetria dispar* are also urticating. He also observed that there are other species of moths which extrude the larval skin, but in these cases it was from flimsy cocoons. Mr. J. H. Durrant also gave instances of this fact.—Prof. Poulton exhibited the larvæ, pupæ and imagines of "*Callioratis*" *pactolicus*, sent by Dr. G. D. H. Carpenter, to illustrate the warning colours of this Hypsid moth in all its stages. He said that Dr. G. D. H. Carpenter had left Damba in December, 1911, and after spending Christmas at Entebbe had gone in January to Bugalla Island, in the Sesse Archipelago, and had found there representatives of all the *Planema-Pseudacræa* associations. The disproportion between *Planema* and *Pseudacræa* is even greater here, so much so that Sesse confirms the Damba records, the results being still more striking. The following papers were read:—"Studies in the Blattidæ," by R. Shelford, M.A., F.E.S.; "*Polyommatus alexius*, Freyer, a good Species," by T. A. Chapman, M.D., F.Z.S., F.E.S.—George Wheeler, M.A., *Hon. Secretary*.

OBITUARY.

William Rickman Jeffrey, who passed away on October 14th last, was born at Ashford, in Kent, in April, 1836. He was the son of J. F. Jeffrey, a member of the Society of Friends. In 1845 he was sent to a boarding school at Croydon and often recalled the bitter winter day, when as a small boy he travelled by the South Eastern Railway (not then opened to Dover) in an exposed carriage without a roof! His health being somewhat delicate, he left school in 1848, and the next three years he spent at Folkestone, where, often roaming over the then much less frequented Warren, he caught butterflies, &c., and acquired that taste for the pursuit of Natural History which he followed throughout his life.

In 1851 he was apprenticed to the late Thomas Nickalls, watchmaker, at Reigate. Here it was his good fortune to receive the kindly notice of the late H. T. Stainton, in the early days of the 'Intelligencer'; when our great and genial lepidopterist frequently came to Reigate overnight, and rising next morning before the people at the hotel were about, he pursued his practical field work in the early morning hours, returning to London in time to superintend the publishing of his weekly and other works. These pleasant hours before business were much valued by W. R. Jeffrey, when invited to join in the rambles; and were often recalled in the correspondence which followed in after years.

In 1857 he was at Scarborough, where the late Thomas Wilkinson was then working out the life-histories of some of the micro-lepidoptera. After a few years spent at Scarborough, and at Guisboro', and afterwards at Saffron-Walden, he returned to his native place, Ashford, Kent. Here life-histories of several of the Pyrales were worked out, in conjunction with the late William Buckler, with whom he was in frequent correspondence. Readers of Buckler's 'Larvæ' will find Jeffrey's name frequently mentioned in that work. Mr. Buckler was so much excited by the emergence of an imago of *H. stagnata*, that he sent a telegram (which was amusingly hashed in transit) announcing that it was out.

In 1876 he met with a specimen of *Pachetra leucophæa*, which afterwards led to the taking of a number of that species, so that it is now represented in most collections. (First notice in the 'Intelligencer for April 18th, 1857, when at Reigate.) Whilst at Scarborough the larva of *Dasypolia templi* was discovered, and at Saffron-Walden that of *Gelechia atrella* in May 1866.

At Ashford he was one of the first to find the larva of *Hypercallia christiernella*. W. R. Jeffrey also turned his attention to the Coleoptera, and had a good collection of beetles. He was also an ardent botanist; of late years the study of the Cryptogams took much of his spare time, and he had many long rambles in his search for mosses, liverworts, and fungi. One of his two sons is Curator of the Herbarium at the Royal Botanic Garden, Edinburgh. He leaves a widow, two sons, and three daughters. He was gathered to his people, at the Friends' burial ground at Kennington, near Ashford, on October 16th.—C. V.

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EREBIA MELAMPUS, Fuessl., IN CENTRAL FRANCE, AND A NOTE ON *E. EPIPHRON* var. *CASSIOPE*, Fabr.

By H. Rowland-Brown, M.A., F.E.S.

While overhauling my this year's captures at Brenner, and transferring the Erebias to the cabinet, I observed among an extended series of *Erebia epiphron* var. *cassiope* from the Central Alps, Pyrenees, &c., two unmistakable males of *E. melampus*, taken by me on the Plomb du Cantal on July 31st, 1909 (*cp.* "Butterflies of Cantal and Lozère," Entom. xlii. p. 267). Apparently this butterfly has never before been recorded from the volcanic regions of Central France, though the higher mountain slopes, where not grazed too closely by cattle, are affected by some other members of the genus. M. Oberthür ('Lépid. Comparée,' fasc. iii. p. 288) tells us that *melampus* is absent from the Pyrenees, despite Staudinger's assertion to the contrary (as quoted by Mr. H. J. Elwes in his "Butterflies of the French Pyrenees" *), and neither I nor the many English entomologists who have explored the range more recently have come across it. Staudinger, in fact, only repeats the brothers Speyer ('Schmett. Deutsch u. der Schweiz.' p. 94), who themselves copied a previous erroneous report. Meanwhile, also, both Guenée and Sand overlooked *melampus* at Le Lioran, nor is it included in Guillemot's 'Catalogue des Lépids. du Puy-de-Dôme,' and it would be as well, therefore, for collectors in Auvergne to keep a sharp look-out for the species. *Erebia œme* was discovered by Bellier de la Chavignerie in the Forez Mountains, somewhat south-east of the Pierre-sur-Haute (5380 ft.), the furthest-west locality ascertained. But no one to my knowledge has since hunted in the beautiful hills that watch over the valley of the Dore, and the noblest of Benedictine Abbeys, La Chaisse Dieu. At sufficient altitudes hereabouts *melampus* may precede its larger congener, for *œme* is usually over before it is on the wing. The dry mountains of the southern Cévennes and Lozère, however, are less suggestive of missing links in the "life line" of the species.

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* Trans. Ent. Soc. Lond. 1887, p. 396.

WHAT IS EREBIA EPIPHRON var. CASSIOPE, Fabr.?

While on this subject, I should like to draw the attention of British lepidopterists to M. Charles Oberthür's remarks (*loc. cit.* pp. 284–88) on the relation of *Erebia epiphron*, Knoch, to its so-called variety *cassiope*, Fabricius.

"In what respect," he asks, "does it actually differ from *cassiope*? According to Staudinger and Rebel, because of the extracellular (antemarginal) rusty band, and the white-pupilled black eye-spots in the female *epiphron*; in *cassiope* the eye-spots are blind, and the rusty bands obsolete; but on the same mountains are found examples of *epiphron* and *cassiope*. *Epiphron*, then, only designates one local race as *cassiope* designates another. There may be localities where *cassiope* predominates, *e. g.* the Grisons; but I think *cassiope* is to be found in all places where *epiphron* exists, and *vice versa*."*

British *epiphron*, he continues (note they are called by the type name), are relatively large. . . . They most resemble the form of the Vosges (which, by the way, is a reputed headquarters of the type), in that each black eye-spot in the antemarginal series of the fore wings is surrounded by a sort of reddish brown circle (this suggests *mnemon*, Haw.), instead of being placed in the middle of a reddish brown band, the exterior contours of which are irregular, and do not form a ring. In the classification of the form *cassiope*, then, should we not denominate it rather as var. et ab., or even only ab. of *epiphron*? Or does the male *cassiope* in its numerous forms differ so materially from the male *epiphron* as to entitle it to varietal rank at all? M. Oberthür suggests that it does *not* differ so materially; and if, as he says, and I have found to be the case, the female with the unpupilled ocellations occurs on the same ground as the female with the white-pupilled eye-spots, would it not be more correct to describe the "unpupilled" *cassiope* as *epiphron* var. et ab. female *cassiope* only?

In this connection the genesis of the names *epiphron* and *cassiope* is exceedingly interesting. Knoch ('Beiträge,' iii. p. 178), without differentiating the sexual forms, is emphatic:—"Alæ superiores ante ocellis duobus, seu pluribus sæpius maculis tantum vel punctis nigris; post eadem ratio. Inferiores supra ocellos tres infra totidem plures(q)ue seu maculas exhibent."

But, on turning to the beautifully executed figure of the butterfly, tab. vi. fig. 7, it will at once be seen that the figure is that of a female white-pupilled on all the wings, and therefore typical female *epiphron*; in fact, I think, in all authors down to a comparatively recent period, wherever *epiphron* is figured, this female of Knoch's is copied and adapted (?) to the male. Thus we find Godart and Duponchel ('Diurnes,' vol. ii. pl. xvi. figs. 3–4) figuring both male and female studded with silvery-white spots on the rufous bands of both wings, and the examples are as large in size as *E. ceto* at least. Nor does the text suggest the absence of the white pupils in the male: "La bande des premières ailes offre de deux à quatre yeux noirs *à prunelle blanche*."

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* For example, Mr. B. C. S. Warren, collecting with me in the mountains above Eaux Bonnes in the western Pyrenees in July, 1911, took one of these white-pupilled females of "*cassiope*"; but all others seen or captured by us were of the usual form (*cp.* Entom. vol. xliv. p. 337); and in the British Museum there is another similar female from the Leach collection among the others taken by Sir George Hampson on the mountains above Luchon.

Herrich Schaeffer figures the male *epiphron* with continuous antemarginal bands on all the wings filled with white-pupilled spots (Schmett. von Europa. pl. xx. figs. 92, 93); but he shows us no more than the under side of the female (fig. 94) with the spots on the abbreviated ante-marginal band of the hind wings only pupilled white. Spuler, also (Schmett. Europas. 1910, pl. ix. fig. 7), figures the male *epiphron*, curiously enough ignoring the typical female altogether as well as both sexes of *cassiope*; and there is nothing in his figure to distinguish it from such male *cassiope* as one may take in the Scotch mountains; at all events, in my copy of this work I can detect no white pupilling of the eye-spots; and I say "curiously," because it seems strange that in a German work of the kind, the female, which should be the characteristic German (Harz and Vosges) *epiphron*, is omitted altogether. Dr. Seitz, however, illustrates both sexes, and in my opinion correctly: the female with white pupils to the eyes, the male with none. Lang, also, figures the male only ('Butterflies of Europe,' pl. lviii. fig. 1); nor does he insist in the text on the white pupils as a sexual character of the female type form alone, but implies, apparently, that these may occur in both sexes.

I have carefully gone through the series of *epiphron* and its forms in the National Collection at South Kensington, including the soi-disant var. *cassiope*, and not until I arrived at Mr. H. J. Elwes's var. *rhodopensis* from the Balkan Rilo Dagh (6500 ft.), could I detect a trace of white pupillation in a single male. In this variety, which is more strongly reminiscent of *E. medusa* by the brilliance of the ocellation in the female, there are males with two tiny apical ocellations on the fore wings, and a smaller pair nearest the costal margin of the hind wings distinctly white-pupilled. On the other hand, none of the males from the Harz and the Silesian Alps, or the Vosges (with white-pupilled females in each case) show a trace of white, so that we may fairly conclude that the typical male *epiphron*, known to entomologists who have more than a book knowledge of the species, is a *plain black spotted form*, and that Staudinger is right in his short diagnosis limiting the white pupilled form to the female . . . "*fascia* (*maculis*) *extrema rufa ocellis* (♀) *albopunctatis*."

I do not think many British entomologists, however, will agree with his version of var. *cassiope*: "maculis rufis obsoletis, ocellis nigris cæcis" (unless he means to imply that the band is simply broken up). We have always regarded our insular forms as *cassiope*, but of the number met with how many can be said to have the band on the fore wings entirely obsolete? A very small percentage, I think; and these in any case referable either to var. (et ab.) *nelamus*, Bsdv., or Tutt's more complete ab. *obsoleta*.

Mr. Wheeler ('Butterflies of Switzerland,' p. 123) describes *cassiope* as differing from the type in that the fulvous band on the upper side of the hind wings is replaced by three or four black dots in fulvous rings, which corresponds more with Fabricius's description, but not with Staudinger's. But, though he does not say so, I gather that he also, when he was writing on the subject, regarded the male *epiphron* as white-pupilled, the male *cassiope* as lacking these eye-spots.

Meanwhile, Fabricius, who is cited as the author of the name *cassiope* ('Mantissa Insectorum,' 1787), gives us a description totally at variance with Staudinger's conclusions:—

"Alis integris fuscis; *fascia rufa*; punctis tribus ocellaribus nigris, posticis subtus punctis solis.

"*Habitat in Austriæ Gramine* Dom. Schieffermyler" (*sic*).

The italics are my own, for I think from what follows, and from Fabricius's limitation of *cassiope* to the Austrian Alps (?), that he may have meant a different insect altogether. "*Præcedenti affinis* at paullo minor," he says. But the preceding species is not, as one might expect, *epiphron*; it is *pyrrha*, F. (= *manto*, Esp.); and I think that any one acquainted with the smaller forms of *manto* transitional to var. *pyrrhula*, Frey, which occurs in the Austrian Tyrol, and generally in the higher alps of the East, would not find it hard to square Fabricius's *cassiope* with some forms of that extremely variable species (*cp.* Mr. Lowe's remarks on *Erebia manto*, and its Varieties, *antea*, p. 145).

Dr. F. J. Buckell, who deals with the subject at some length in his admirable study of 'Erebia Epiphron and its Named Varieties' (Ent. Record, vol. v. pp. 161–165), hazards no suggestion of this possibility. He does not mention the fact that Fabricius associated his *cassiope* with *manto*—the type form of which butterfly is surely so entirely different in appearance, and everything else—habits and flight—from our "Small Mountain Ringlet." For whereas in my experience *cassiope* is on the move only when the sun is shining, *manto* will fly even on the greyest days. Dr. Buckell may, indeed, have been unacquainted with the forms of *manto* in the eastern alps.

We know, then, what we mean by *cassiope* in Britain and Ireland. What we want to make sure of is what Continental authors and collectors mean by male *epiphron* in contradistinction to the male of the so-called variety.

THE LEPIDOPTERA OF THE NORWEGIAN PROVINCES OF ODALEN AND FINMARK.

By W. G. Sheldon, F.E.S.

(Continued from p. 315.)

From July 18th I spent five days at Kistrand, the principal village in the district, and the residence of the only clergyman, doctor, and herdsman in the Porsanger Fjord. I found excellent quarters with Herr Lillebo, the local merchant. Schöyen, in 1879, captured here some examples of the very rare *Brenthis chariclea*, flying in swampy meadows with *B. pales*. The first four days of my stay the sun did not appear, but on July 23rd it shone brilliantly; *B. pales* on this day was not uncommon, but the rarer species could not be turned up. On the evening of this day I left, with much regret, the most interesting Porsanger district, and, travelling in the local steamer to Hornigsvaag, the next day boarded the mail boat there, in a perfect hurricane. Fortunately the passage is partly sheltered by islands, and thus we did not get the full effect of the storm, but what we did get was more than sufficient for almost the whole of the passengers.

On my return journey I stayed three days at Tromsö, chiefly to see the Museum, but partly also to do some collecting. Unfortunately the sun did not shine during my stay, and consequently I did not see there a single butterfly.

From Tromsö I travelled direct to Trondhjem, at which port I booked a passage to England on the Hull boat.

I suppose the weather during my stay within the Arctic Circle was about an average of what is to be found there in June and July, and certainly it was much better than what I experienced in 1911 in one respect—the number of perfect days enjoyed; though in other ways there was not much difference in the two years. On turning up my diaries I find that in 1911 I spent thirty-three days in Lapland; out of these only two were cloudless. On twenty there was more or less broken sunshine, and on eleven the sun did not break through the clouds. This year I was in Finmarken forty-two days, of which fifteen were perfect, ten not perfect, and seventeen cloudy throughout; unfortunately, five of the perfect days were wasted—from a lepidopterist's point of view—by my having to travel on them from Bossekop to Kolvik, a distance as the crow flies of about fifty miles, but through swamps, over mountains, and through roadless, uninhabited, and impossible country.

In addition to the Porsanger there are three other fjords in Arctic Norway east of the North Cape; of these the most easterly, the Varanger Fjord, is well known entomologically, but the other two, the Laxe and Tana Fjords, have, I believe, never been explored for Lepidoptera. I understand there is accommodation to be found in both of them, and I was informed at Kistrand, by Pastor Astrup, that the vegetation is even more luxuriant there than is the case in the Porsanger Fjord.

Mosquitoes were not much in evidence at Bossekop, Kolvik, and Kistrand, but at Laxelv they were in countless millions in the forest, and my experience there was the worst I have ever had to put up with in this respect.

The utter impossibility of accurately forecasting the date on which one should be on the collecting ground in Arctic Scandinavia was strikingly exemplified by my receiving a letter from Herr Sparre Schneider, which was written in May, and in which he stated that the season at Tromsö promised to be an early one, whereas when I got to Bossekop in early June, I found that in consequence of a cold spell everything was very backward and the season a late one.

I had a good opportunity of testing the effect of the perpetual daylight upon the flight times of Lepidoptera, and the result of my observations was that I found the Diurni were not on the wing before 8 a.m. and that the flight was practically stopped by 4 o'clock in the afternoon. I was out at 6 a.m. on several bright sunny mornings, but although an occasional *Erebia lappona*, or *Œneis norna* was to be kicked up between 7 o'clock and 8 o'clock, they did not fly of their own accord until the latter hour. The Geometræ flew fairly freely in the afternoon, but their natural flight time was from 6 p.m. to midnight and after. It was very striking to see a large Geometer such as *Gnophos sordaria*, a species resembling our *G. obfuscata*, flying gently in the full light at midnight, depositing ova. The Noctuæ I saw consisted mostly of Anartas. These flew in the bright sunlight of mid-day. But the same habit obtained in the other species I came across, includng *Plusia hochenwarthi*, and *Pachnobia hyperborea*.

The species of Lepidoptera I met with in Finmark are as follows:—

Pieris napi.—This species was rare at Bossekop; perhaps it was not fully out, for it is usually abundant there. It was not uncommon at Kolvik. The chief characteristic of the Northern Scandinavian *P. napi* appears to be the profusion of dark shading on the veins on the under side of all the wings, more especially on the inferiors. This tendency culminates in certain of the males, in which the shading on the veins almost covers the inferiors, and on all wings terminates on the outer margins in broad wedges, not gradually tapering to a point, as is the case in Central European forms. This extreme form, of which I have examples from Bossekop and Kolvik, and also from Abisko in Swedish Lapland, is figured on Plate xiv., fig. 4, and I propose for it the name *arctica*, n. ab. The females, which are of course all var. *bryoniæ*, have a strong tendency to ochreous, especially on the under side of the inferiors.

As far as I could ascertain, the food-plant in Finmark is *Draba incana*, which is almost the only crucifer I came across there.

Colias hecla.—This most beautiful species was apparently not out at the time of my visit to Bossekop, where previous observers had found it not uncommon. I was fortunate enough, however, to come across it in great abundance in the open meadows lying on both sides of the river at Laxelv (see Plate xi.), flying swiftly with the customary *Colias* flight and often settling on and sucking at the flowers of *Astragalus alpinus*, which to my surprise I found to be the food-plant of the larva, and which thus in addition furnishes the imago with sustenance. It will be remembered that last year I found the food-plant of the other arctic species of this genus *C. nastes* at Abisko to be *A. alpinus* also. The imago, especially the male, by its swift low flight amongst the plants of *Vaccinium*, *Empetrum*, &c., which grow in its habitat, soon gets damaged, and on the day on which I first came across it, July 11th, I had to exercise a good deal of selection to get good specimens. Ova were plentiful, and I now have larvæ hibernating in the third stage.

The series of about one hundred examples I brought home is a very variable one; the males vary in size from 42–50 mm., and the females from 44–54 mm.

On looking over the European series in the National Collection I find that a few of the males have a rosy suffusion on the upper sides of all the wings, similar to that which is found in some male *Colias edusa*; in my series fully seventy-five per cent. have this rosy suffusion, which is very pronounced and beautiful in some specimens; for this form I propose the name *rosea*, n. ab. The ground colour of the male varies very much, the majority are of a rich red orange, but a few are of a much lighter orange tint, not darker than in typical *C. edusa*, whilst one example has the entire upper side of the brown colour of typical male *C. heldreichi*, the darker margins being brown, also of a darker tint; this specimen is, however, not freshly emerged, and one suspects abnormal conditions after emergence have caused what is certainly a remarkable form.

There is a tendency in some of the males for the light veins crossing the dark margins to be reduced in number and distinctness, some specimens being entirely without them; there are examples in the National Collection of this form labelled Kvickjock, and Lapland; a suitable name for it appears to be ab. *suppressa*, n. ab. Professor Aurivillius who is responsible for the European specimens being named var. *sulitelma*, has only described the female as "above rather more vivid in tint, brown or sometimes rose-flushed, much less suffused with black." He does not mention some of the most characteristic features of this sex, for instance, the prominent light blotches in the dark marginal band, described by Lefebvre in 'Annales de la Société Entomologique de France,' tome v., p. 386—the original description of *C. hecla*—to be seven in number in the front, and four on the hind wings, and therefore one can only assume that as Aurivillius does not distinguish var. *sulitelma* from the type in this respect, he did not notice the difference. My Porsanger examples have almost all seven pale blotches on the superiors, though one has six, and another only five; but the whole of them have six blotches on the inferiors, and I find that almost all the European examples in the National Collection are of this form, which one must therefore conclude should be the typical European form in this respect. Lefebvre's specimens, which he states came from Iceland—where we now know *C. hecla* does not occur—were no doubt from Arctic America, judging by the figures. The variation of the hind wings in my specimens takes two forms, one is the extra distinctness of the blotches, and this is emphasized in those specimens which have an extra dark marginal band, or dark ground colour to the wings. This form I have figured on Plate xiii., figs. 5 and 7, and propose for it the name *distincta*, n. ab. In the other form the lower four blotches are suffused with the ochreous ground colour of the wings, and they thus become much less distinct; for this form (see Plate xiii., fig. 6) I propose the name *ochrea-suffusa*, n. ab.

A few of my females have the base of the superiors with dark suffusion; there are specimens of this form in the National Collection, a suitable name for which appears to be *obscura*, n. ab. (see Plate xiii., fig. 8). There is a good deal of variation in both sexes in the shape and size of the discoidal spot in the centre of the superiors; in the males in some cases it is a narrow line, in others it is as broad as it is long. Lefebvre describes and figures this spot in the female "with an orange centre"; my specimens generally agree with this, but in about ten per cent. the orange centre is wanting, which thus might be called *nigro-punctata*, n. ab.

Rumicia phlæas, var. *hypophlæas*.—This fine form I had expected to meet with freely, but only saw two males, both of which were captured at Laxelv; one of them is ab. *cæruleopunctata*.

Polyommatus optilete.—Abundant at Laxelv. Amongst *Vaccinium*.

Aglais urticæ.—The only larvæ I saw were a colony at Börselv, which I managed to bring home as pupæ; these emerged in the middle of August as fine dark examples, not, however, so strongly banded as some I obtained at Abisko last year; they were, of course, all tending towards var. *polaris*.

Brenthis pales, var. *lapponica*.—Fairly common at Laxelv and Kistrand, but not so abundant as I expected to find it.

B. freija.—Not infrequent at Bossekop, and in good condition. In the Porsanger Fjord it was not common; I saw one or two worn examples at Börselv on July 7th, and perhaps half a dozen others a week later at Laxelv.

(To be continued.)

BY THE WAY.

We have read with such attention as it deserves the proposal of the Entomological Society—as Verrall said, being the oldest Society of the kind it lacks all need for the minimising appange "of London"—to the infant International Congress of Entomology, respecting priority of nomenclature; and we have no hesitation in asserting that nothing short of an appeal to the Hague Tribunal will bring about the effect they desire. Edward Saunders discarded *Cyllocoris flavoquadrimaculatus*, De Geer, because it was too long a specific name. We are inclined to add *sic;* but each author is, at least for the nonce, a law unto himself (unless he is suffering from an editor). Moreover, the present system is inconsistent: it admits such generic terms as *Piezodorus*, *Tropicoris*, and *Acetropis*, but rejects individuality to Prof. Westwood's memory by writing *westwoodii*—this is surely but a step short of rendering the name *occidentalisilvæ*! Entomological topics have become too specialized to often be of wide interest, and we think nomenclature in all its aspects that most fitted for general discussion, utterly bootless though it be.

A contemporary publishes some elucidation of the cause of the "humming in the air" so often heard on summer days, for which Gilbert White and later authors have lacked an explanation. That it is caused by dancing Chironomi shortly before dusk is true enough; but it is not confined to that hour, and Mr. J. E. Collin is of opinion that the facts stated cover but part of the ground necessary to clear up the whole mystery. The humming is a very well-known phenomenon, and the author of 'The Caxtons' has turned it to a philosophical simile in 'Kenelm Chillingly' (1873, i. 320) thus:—"I declare I know no more why the minds of human beings should be so restlessly agitated about things which, as most of them own, give more pain than pleasure, than I understand why that swarm of gnats, which has such a very short time to live, does not give itself a moment's repose, but goes up and down, rising and falling as if it were on a seesaw, and making as much noise about its insignificant alternations of ascent and descent, as if it were the hum of men." The devotee would answer with our author—

> "It is thou who art shoreless on every side,
> And thy width will not let thee enclose content."

C. M.

NOTES AND OBSERVATIONS.

Mortality among Delphax (Aræopus) pulchella, Curt.—The larvæ of this species of homopteron were in countless thousands at the base of reeds and on the moist mud between them in Covehithe Broad, on the Suffolk coast, last July, and the younger, less agile ones appeared to form the staple food of every carnivorous insect there. I saw neither *Pæderus fuscipes* nor *Coccinella 19-punctata* actually prey upon it, but *Bembidium*, *Nabis*, and a micropterous Alysiid (closely allied to *Allœa contracta*, Hal.) certainly did so, for in one or two places, where the base of the reeds had grown circularly together, forming a kind of chamber above the mud—a place where the saltatory powers of *Delphax* would be of little avail for escape—were great numbers of their sucked skins with gorged individuals of those species; the Alysiid, however, was more probably in search of a dipterous victim, for no males were apparent. The mortality must be very great and the oviposition of the survivors prolific, for in September perfect *Delphax*, though not rare, are only in their tens where now the larvæ are in their thousands. I fancy other Coccinellæ must attack them too, for both *Micraspis 16-punctata* and *C. 11-punctata* were common, though I saw with careful searching but a single specimen of an Aphid, which was a winged *Hyalopterus arundinis*, Fab.—CLAUDE MORLEY.

ON THE HABITS OF PARYDROPTERA DISCOMYZINA, Collin (MS.) In the middle of September, 1910, two specimens of this new dipteron occurred to me in a salt-marsh at Southwold; this was just before dusk. Accordingly at dusk I searched for the species at the same spot on several subsequent occasions, but with no success till the 17th of last July, when four examples were secured, with several the next day. These were only aroused from the salt-marsh plants (*Aster*, *Sueda*, *Spergularia*, *Atriplex*, &c.) by smoke; then they would jump from the mud level to about an inch up the pressed-back herbage, and great care was necessary in bottling or a second leap was made—usually downwards, though the insect invariably headed upward. This frequently led to loss, as it was usually effected through some aperture in the stalks and the fly lost to sight; nor was it often again aroused, even by smoke. Thus I lost nearly half those seen. The appearance when alive is that of a shining and peculiarly convex *Salda*, for the wings are pressed flat to its back and apically deflexed; and the saltatory powers are very similar in degree. This time it occurred in the same salt-marsh as formerly, though some hundred yards from the original spot, where a diligent search failed to reveal it. In both situations it was found on ground just too wet to lie upon (though I did!), and yet by no means covered with water; so salt was this that sand-hoppers and whelks kept *Parydroptera* company. In all I secured some two dozen examples with three hours' close work.—CLAUDE MORLEY; Monk's Soham House, Suffolk.

THE ADAMS COLLECTION OF LEPIDOPTERA.—This exceedingly rich and very extensive collection of Lepidoptera is now installed in the Natural History Museum at South Kensington. It is contained in sixty-eight cabinets and numerous store-boxes. The number of specimens probably totals something like one hundred and fifty thousand, among which are hundreds of types.

THE SUFFERT COLLECTION OF BUTTERFLIES.—The large collection of African butterflies, with its numerous types, formed by the late Herr E. Suffert, of Berlin, has passed into the Joicey Collection. Entomologists are invited to compare their specimens with the types.—J. J. JOICEY; The Hill, Witley, Surrey.

COLIAS EDUSA IN NORTH DEVON.—On August 20th, 1912, as my wife and I were walking along the road from Northam to Appledore, a fine specimen of *Colias edusa* flew over a gate into the road, but escaped before I could get out my net, which had just previously been placed under my rainproof coat during one of the many showers which fell on that day.—C. GRANVILLE CLUTTERBUCK; 23, Heathville Road, Gloucester, November 8th, 1912.

COLIAS EDUSA, &c., IN NORTH DEVON.—I arrived here on the 8th inst. On the 9th *Colias edusa* was seen, and a full-grown larva of *Sphinx ligustri* taken at Torrington. On the same day a fresh-looking *Epinephele ianira* was seen, and numbers of *Pyrameis atalanta* and *Plusia gamma*, a few *Vanessa urticæ* and one *V. io* were noticed flying around and settling on various clumps of Michaelmas daisy in the gardens. On the 11th three *C. edusa* were seen at Tawstock, near Barnstaple, and several *Pararge egeria* in the lanes. Sugar was tried that evening, but was only visited by one *Phlogophora meticulosa*, and one *Amathes pistacina*. On the 12th a bright male *edusa* was captured in the garden, and great numbers of *P. gamma* were flying at dusk among flowers of *Antirrhinum*. On the 17th several *Pieris brassicæ* and *P. rapæ* were seen at Ilfracombe. Sugar was tried again on the night of the 19th, and single specimens of *Agrotis saucia*, *Lithophane socia*, and *Graptolitha ornithopus* were taken, and several *Agrotis suffusa* and *P. meticulosa* were seen. On the 25th my wife caught a light-coloured *edusa* in her hand in a road close to the house. It was very feeble and worn, so she let it go. It was probably a female. There has been a lot of rain and gales of wind lately and the nights have been too cold for sugar or ivy. If the weather had been brighter and warmer in September and during this month, I believe it would have been a record year for *edusa* in this neighbourhood.—GERVASE F. MATHEW; Instow, North Devon, October 30th, 1912.

COLIAS EDUSA, PYRAMEIS ATALANTA, AND P. CARDUI IN WILTS.—I saw one *C. edusa* male on Sept. 7th, the first I have seen during the eleven years I have been here. The larvæ of *Pyrameis atalanta* have been abundant, and with them I found two larvæ of *P. cardui*, also feeding on nettle. I did not recognize that the two were not *P. atalanta* larvæ until they changed to chrysalids. All the larvæ were taken in August and September, *P. atalanta* emerging from August 30th to October 18th; the first *P. cardui* on August 31st, and the other on October 7th.—(Rev.) C. A. SLADEN; Alton Barnes Rectory, Pewsey, Wilts, November 1st, 1912.

PYRAMEIS ATALANTA.—On June 19th I found a larva of the above nearly full grown; it pupated on June 24th and the butterfly emerged on July 10th. One full-fed larva obtained on September 8th pupated on September 12th, and the imago emerged October 2nd.—W. E. BUTLER.

AGROTIS HYPERBOREA (ALPINA), &c., IN PERTHSHIRE.—On August 5th I took a worn female specimen of *Agrotis hyperborea* at rest on crowberry on a spur of Schiehallion. The capture of the imago seems to be somewhat unusual, but it was still more unusual to find a few fresh females of *Argynnis aglaia* on the wing within two or three hundred feet of the crowberry line some minutes later.—C. Mellows; The College, Bishop's Stortford.

Eurois occulta and Cosmia paleacea in Yorkshire.—This species is in its old York habitat this year. One specimen came to sugar on the night of July 24th. Mr. Walker tells me that the species had not been seen in the locality for several years. *C. paleacea* was very abundant at sugar the same night.—C. Mellows.

Further Additions to the Gloucestershire List of Lepidoptera.—Thanks to Mr. E. Meyrick's kindness in identifying the specimens I am able to add the following species to our county list:—*Mompha* (*Laverna*) *lacteella*, "curious abnormal dark form, the whitish ochreous area obscured by dark fuscous suffusion," taken on March 28th and April 9th, 1912, on the window of a railway station on the outskirts of the Forest of Dean; *Aristotelia* (*Doryphora*) *pulveratella*, taken on the Cotswolds on April 25th, 1912, flying in the afternoon; and *Coleophora deauratella*, also taken on the wing in the afternoon sunshine near Gloucester on May 19th, 1912.—C. Granville Clutterbuck; 23, Heathville Road, Gloucester, November 8th, 1912.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 2nd*, 1912.—The Rev. F. D. Morice, M.A., President, in the chair.—Miss Lily Huie, Hollywood, Colinton Road, Edinburgh, was elected a Fellow of the Society.—The death was announced of the Hon. Fellow, Prof. L. Ganglbauer, of Vienna, and also of Messrs. R. Shelford, M.A., F.Z.S.; E. A. Fitch, F.L.S.; and G. H. Grosvenor, M.A.—Dr. Nicholson showed three specimens of *Adalia obliterata*, L., ab. *sublineata*, Weise, an aberration not as yet recorded from Britain.—Mr. G. T. Porritt, various forms of the variety *nigrosparsata*, together with the type specimen of the var. *nigra* of *Abraxas grossulariata*, all bred from larvæ and pupæ collected from one garden at Huddersfield during the present year.—Commander J. J. Walker, series of the following rare species of British Coleoptera, recently taken in the Oxford district:—*Lathrobium pallidum*, Nord.: *Apion annulipes*, Wenck., male and female; and *Psylliodes luteola*, Müll. Also a specimen of the so-called "insect-catching grass" (*Cenchrus australis*), from Cairns, N. Queensland, with several Coleoptera, belonging to various genera, adhering to the spinous awns.—Mr. R. M. Prideaux, a beautiful aberration of *P. cardui*, closely resembling one figured by Newman.—Mr. C. J. Gahan, a small series of *Phromnia superba*, Melich, a dimorphic species of Homoptera of the subfamily *Flatinæ*, taken by Dr. A. C. Parsons in Northern Nigeria, and read a letter received from Dr. Parsons to explain the great interest attaching to the specimens.—Mr. W. A. Lamborn, a series of twelve Homoptera of the genus *Flata*, all taken feeding on one plant, seventy miles east of Lagos, on December 1st, 1911. The insects were dimorphic, and he stated that the pink and green forms were mixed as they rested on the plant.—Prof. Poulton, an apparently uninjured example of *E. jacobææ* given him by Mr. Roland Trimen, F.R.S. The moth was flying slowly at midday in his garden at Woking, when a robin captured it on the wing and flew with it behind a bush. After about three minutes the bird flew away, and Mr. Trimen found the moth lying upon the ground.—Dr. T. A. Chapman, several unusual forms of some common "blues" taken this year in the Valley of the Isère and at Courmayeur. He said that the "blues" of this region are generally large and more than usually variable; and that it is also the headquarters in Western Europe of *Agriades alexius*, Frr.—Mr. Donisthorpe, a number of males of *Ponera coarctata* which he had swept at Box Hill, and remarked that no one living appeared to have taken males in Britain. Also males, females, and workers of *Formicoxenus nitidulus*, taken in a nest of *F. rufa* at Weybridge. Also males, females, and workers of *Leptothorax tubero-affinis*, a form new to Britain. Also a male, and winged and deälated females of *Anergates atratulus*, which lives in the nests of *Tetramorium cæspitum*.—Mr. Hy. J. Turner, on behalf of the Rev. C. R. N. Burrows, a long series of bred *Celastrina argiolus*. He stated that the larvæ had occurred each year for some time past in the garden at Mucking, feeding on Portugal laurel, attacking the flower buds in the early summer. The whole of the specimens were unusually large. Many of the females had a strong development of whitey-blue on the basal half of the costal area, and there was a tendency to develop a whitish suffusion in the discal area of the fore wing. The form closely resembled the Nearctic form *pseudargiolus*. He believed that the food-plant had not hitherto been recorded. He also exhibited a curious colour-print of an "Entomologist," published in 1830 in London, in which the whole of the figure was ingeniously made up of various species of the Insecta, only the face being human.—Mr. L. W. Newman, specimens of *Dianthœcia*, bred from North Kent wild larvæ, resembling exactly, both in size and coloration, *Dianthœcia capsophila* from the Isle of Man. This appeared to confirm the opinion of several leading men that *D. capsophila* and *D. carpophaga* are the same species. He also showed for comparison varied series of *D. carpophaga*; a pair of *D. capsophila* and *D. capsincola*.—Mr. W. G. Sheldon, a series of *Colias hecla*, from the Porsanger Fjord, Arctic Norway, with specimens of the other orange species occurring in Europe for comparison.—Mr. W. J. Lucas, a living male of *Labidura riparia* (the Giant Earwig), taken on the shore near Christchurch, Hants. He also exhibited a drawing giving the colour of the living insects, and demonstrating how well they are protected by resemblance to the pale sand of the Hampshire coast.—Mr. G. T. Bethune-Baker, specimens of *Hepialus pyrenaicus*, a species found not uncommonly on the higher parts of Mount Canigou, with the apterous female. Also a fine form of *Lycæna arion*, and a specimen of *Heodes hippothoë* that was at once radiated, obsolescent, and asymmetrical.—Mr. Douglas Pearson, a drawer of Rhopalocera from the Black Forest and the Swiss Alps, including an albinistic specimen of *Erebia lappona*, an unusually large female of *Melitæa varia*, the large Black Forest form of *Colias palæno*, *Brenthis pales* from Pontresina, with under side hind wings of a deep purple-red, and others.—Mr. J. A. Simes read the following note:—

"On the 15th July, 1912, I came across *Erebia glacialis* in some numbers on a scree slope below the summit of the Colette de Gily, Dauphiny, and saw a female alight on a piece of loose rock on the slope, sun itself for a time and then proceed to walk slowly backwards until it reached the lower end of the rock. It then bent its abdomen underneath the slab of rock and deposited an egg on the lower surface of it. I subsequently observed a second female behave in precisely the same manner, and eventually deposit an egg on the under side of a detached slab of rock on the scree slope."—The President exhibited a species of *Osmia* and its cell, found three and a half years ago, beside a little stream at Jericho, and which only emerged during the Oxford Congress this year.—Mr. H. Baker Sly, a very dark example of *Brenthis selene*, having the under wings clouded with dark brown all over, except for a slightly lighter shaded spot in the middle, and the upper wings very heavily clouded with dark brown; it was taken in Worth Forest, Sussex, May 26th, 1912. He also showed a specimen of *Epinephele ianira*, one upper wing having a white blotch at the tip, and also the under wing on the same side with a white streak, taken at Box Hill, August 11th, 1912. The following papers were read:—"Life-history of *Lonchæa chorea*," by A. E. Cameron, M.A., B.Sc.; communicated by H. S. Leigh, F.E.S. "A Few Observations on Mimicry," by W. J. Kaye, F.E.S.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 11th.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Dennis exhibited galls from the poplar-tree made by two species of Aphis, *Pemphigus bursarius* and *P. spirothecæ*, the former of a pyriform shape on the petiole, and the latter of a spiral shape, also on the petiole.—Miss Fountaine, a fine set of examples, mostly bred by herself, of species of *Callidryas* from the West Indies and South Africa, with the large species of *Gonepteryx* from America.—Mr. Main, living larvæ of *Pyrameis cardui* from Eastbourne, and a fine series of *Pieris napi* and var. *bryoniæ*, the results of recent experiments.—Mr. J. Platt Barrett, a bred specimen of *Charaxes jasius* from Sicily, and made remarks on the spring and early summer of the present year in that island.—Mr. Step, photographs of the leaves of the maple and sycamore, with the cases of the sawfly larva, *Phyllotoma aceris*, and remarked on the occurrence of the species at Ashtead and Oxshott. Several other members had also met with the species.—Mr. Adkin, the cocoon of *Platysamia cecropia*, previously shown by Mr. Dods, and pointed out that the inner envelope of the cocoon was reversed, hence the imago had to emerge from the wrong end of the outer envelope. He also showed several bred series of *Coremia ferrugata*, and read notes on the variation.—Mr. H. Moore, a variety of *Papilio phorcas* from Africa, in which the veins were margined with white on the green areas of both wings.—Mr. Sich, the pupa-cases of *Libythea celtis*, showing that the pupa lies in a horizontal position under a leaf without a girdle, and also white egg-shells of *Cerura vinula* found in Sussex.—Mr. Edwards, two large species of Eastern Satyridæ, *Neorina hilda* and *N. crishna*.

July 25th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—

Mr. West (Ashtead) exhibited ova of a *Chrysopa* on the leaves of the garden ox-eye daisy. — Mr. Edwards, the butterflies *Eunica eurota* from Brazil, *Smyrna blomfeldii* from Mexico, and *S. karwinskii* from Brazil.—Mr. J. Platt Barrett, a full-fed larva of *Saturnia pyri*, from Sicily, young larvæ of *Colias edusa* from ova of an English caught female, and a large number of butterflies from South Africa.—Mr. R. Adkin, *Ptycholoma lecheana* from Brentwood, one almost unicolorous buff colour and unusually pale, the other a rich deep brown with very distinct silvery markings. — Remarks were made on the abundance of *Celastrina argiolus*, and the occurrence of *Sesia stellatarum* and *Colias edusa* this season.

August 8th.—The President in the chair.—Mr. Ashby exhibited larvæ and imago of the local coleopteron, *Cassida fastuosa*, from Otford. — Capt. Cardew, larvæ of *Papilio machaon* from Stalham Dyke spun up for pupation. — Mr. Hugh Main, larvæ of *Papilio alexanor* from the South of France.—Mr. H. Moore, a short series of *Colias edusa* taken in the Forest of Arques, Dieppe, in August.—Mr. Priske, a female cockroach, *Periplaneta orientalis*, with the ootheca still attached to her.—Mr. F. D. Cooke, the pupæ of *Pyrameis cardui* to show the difference between those spun up on white muslin and those on darker material.—Mr. Newman, long series of *Dianthœcia carpophaga*, specimens of *D. capsincola* and *D. capsophila*, and Kentish *Dianthœcia* identical with Isle of Man *D. capsophila*.—Mr. Blenkarn, *Haliplus wehnckei* with aberrant œdeagus, a specimen of *Clytus arietis* with the first yellow belt reduced to a minute spot, an unusually small example of *Philonthus puella*, and specimens of the very rare coleopteron, *Pentarthrum huttoni*, from the cellars of Messrs. Möet & Chandon.

August 22nd.—Mr. B. H. Smith, Vice-President, in the chair.—Mr. Edwards exhibited the exotic butterflies — *Thaumantis diores* from Assam, *Discophora lepida* from Ceylon, *Tenaris selene* from the Malay, and *T. honrathii* from Madagascar, all belonging to the Asiatic section of the Morphinæ; and specimens of *Opsiphanes boisduvalii* from Mexico, referring to the conspicuous tuft of scent-hairs.—Mr. Newman, a very long series of *Pachnobia hyperborea* from Rannoch, showing much variation; a short, very uniform series from Shetland, where the species was fast disappearing from the attacks of ichneumons; a few *Crymodes exulis* from Shetland, including a very pale specimen; and a long series of his inbred yellow form of *Callimorpha dominula*, with the only intermediate he had obtained.—Mr. Sheldon gave a very interesting account of his holiday near the North Cape in search of butterflies and birds' eggs.—Mr. Sich, specimens of *Coleophora apicella*, taken at Byfleet in June, where its food-plant, *Stellaria graminea*, grows abundantly. — Mr. Adkin, *Chrysopa* ova, which were on unusually short stalks.—Reports were made that larvæ were very scarce this season, especially in the New Forest. *Bryophila perla* was noted as very scarce. *Agriades coridon* was still common in Hertfordshire, and several var. *semi-syngrapha* had been taken, while the females varied from very deep black to khaki-coloured ground. Capt. Cardew noted the curious fact that *B. muralis* was common at Folkestone, but completely absent from Dover, where apparently conditions were most favourable.

September 12*th.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Tonge exhibited an *Ephestia* sp. bred from an Egyptian date.—Mr. Moore, galls found on the wild rose.—Mr. Gibbs, a *Rumicia phlæas* from Woburn, a combination of ab. *radiata* and ab. *cæruleopunctata.*—Capt. Cardew, an *Apatura iris* with much fulvous shading on the fore wings and apex of hind wings; a series of *Eupithecia subfulvata*, bred, from Northumberland; and living larvæ of *Acidalia immutata.*—Mr. Curwen, a large summer form of *Pieris napi* with rays evanescent, *Polyommatus icarus* ab. *semi-arcuata*, *Agriades coridon* with aberrant markings on the under sides, and an *Argynnis niobe* var. *eris* with an extremely deep green ground on the under sides of the hind wings.—Dr. T. A. Chapman, specimens of *Agriades alexius* and of *Polyommatus icarus* ab. *icarinus*, and gave a detailed account of the former species, which Freyer put forward in 1858.—Mr. Tonge reported *Leucania albipuncta* at sugar at Deal, and specimens of *Polia chi* at Winslow, in Bucks.—Mr. Sich read his report as delegate to the International Congress of Entomology at Oxford in early August.

September 26*th.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Dr. Chapman exhibited varieties of "blues" taken in the French Alps this year, where several species were of unusually large size; they included *Polyommatus icarus* resembling *P. escheri*, *Agriades thetis* ab. *punctifera*, a possible hybrid between *P. damon* and *A. coridon*, &c.—Mr. Colthrup, long series of *Pachygastria trifolii* from Romney and Eastbourne, the former showing much variation, especially in the males; specimens of *Satyrus semele* with the eye-spot in the anal angle of the hind wings absent; an unusually large example of *Colias edusa* var. *helice*, &c.—Mr. Newman, a long bred series of *Papilio machaon*, of fine size mostly, but only showing trivial variation in size and position of the discoidal spots, in amount of blue in the hind wings, in the breadth and depth of colour of the transverse bands, &c.—Mr. Hugh Main, a beetle, *Caryoborus nucleorum*, bred by him from the Coquilla nut previously exhibited with the larva in by Mr. Joy.—Mr. J. P. Barrett, the larvæ of *Cebrio gigas* (?), a coleopteron occurring somewhat freely in his son's garden in Messina, doing injury to his potatoes; a short series of *Lycæna arion* from Cornwall, *Ægeria muscæformis* and *Dianthœcia luteago* var. *ficklini* from the same county, and a huge earthen cocoon of *Manduca atropos.*—Mr. Tonge, a fragment of slate from Cornwall containing a fossil in appearance very much resembling an orthopteron.—Mr. Curwen, a very varied series of *Brenthis pales* from Switzerland.—Mr. Blenkarn, the rare coleopteron, *Henoticus serratus*, taken in the offices of Messrs. Möet & Chandon's, Northumberland Avenue; and a series of bred *Porthesia chrysorrhœa* from Sandown, including two with bright golden tufts instead of the usual rich brown.—Mr. Lucas, a living female of the rare orthopteron, *Metrioptera roeselii.*—Mr. Turner, for Rev. C. R. N. Burrows, a beautiful series of *Celastrina argiolus*, bred from larvæ taken on

Portugal laurel, notable for their large size and brilliant coloration, approaching the American form *pseudargiolus*.

October 10*th*.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Lucas exhibited specimens and detailed drawings of the species of British earwigs to illustrate his paper, with living examples of the very local *Labidura riparia* from Christchurch.—Mr. Tonge, a very dark-marked example of *Acidalia ornata* from Reigate.—Mr. Sheldon, a long series of *Colias hecla* from North Lapland, with examples of other European *Colias* species for comparison.—Mr. Adkin, specimens of *Nola albulalis* bred from larvæ that had hybernated in confinement.—Mr. Newman, a long series of *Agriades coridon*, including several ab. *semisyngrapha*, from Royston, and showing in the females much variation in the ground colour of both upper and under surfaces; and third generation specimens of *Ennomos quercinaria*, all with the apex of the fore wings dark—twenty-five per cent. of the second generation had been melanic, of a dark chocolate colour.—Mr. Lucas read a paper on "Earwigs that Breed in Britain," and illustrated his notes with a large number of lantern-slides.—Hy. J. Turner (*Hon. Rep. Sec.*).

Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, *October* 21*st*, 1912.—Mr. Wm. Webster, Vice-President, in the chair.—This being the opening meeting of the session was devoted to exhibits of the past season's work.—Mr. F. N. Pierce showed a box of Lepidoptera from Silverdale, Lancashire, which included *Nemeobius lucina*, *Argynnis euphrosyne*, and *Euclidia mi*; from Tansor, Huntingdonshire, *Schœnobius mucronellus*, *S. forficellus*, *Acentropus niveus*, *Hydrocampa nympheata*, *H. stagnata*, and *Paraponyx stratiotata*; also *Scopula ferrugalis* from Oxfordshire.—Mr. L. West exhibited his recently published work 'The Natural Trout Fly and its Imitations,' containing a fine series of coloured illustrations of the flies used by the angler for trout, together with a set of the artificial flies inserted on special pages.—Mr. B. H. Crabtree, two drawers containing his very fine series of variations of *Abraxas grossulariata*, including vars. *nigra*, *nigro-sparsata*, *nigro-cærulea*, *flavo-fasciata*, *hazeleighensis*, *lutea*, *varleyata*, and other striking forms.—Mr. R. Tait, Jun., a long bred series of *Agrotis ashworthii*, with vars. *substriata* and *virgata*; very fine set of *A. agathina*, including var. *rosea* and a melanic form of *Boarmia repandata* from North Wales; *Leucophasia sinapis*, *Colias edusa*, *Ligdia adustata*, *Bapta temerata*, and *Melanippe galiata*, from South Devon; *Tephrosia luridata*, from Wyre Forest; and *Nyssia zonaria*, from Conway.—Mr. W. A. Tyerman, the following species from Ainsdale, viz.:—*Procris statices*, *Neuria reticulata*, *Dianthœcia nana*, *Plusia festucæ*, *Phibalapteryx lignata*, and *Eupithecia satyrata* var. *callunaria*.—Mr. W. Mansbridge, Micro-Lepidoptera collected in Lancashire and Cheshire during the past season, *viz.*, a long bred series of *Tortrix costana* and melanic and intermediate variations; a long bred series of *Phycis fusca*; series of *Micropteryx unimaculella*, *Coleophora fuscedinella*, and *C. lutipennella*, *Ornix betulæ*, *Lithocolletis quercifoliella*, and *L. cramerella*, from Delamere; *Pancalia leuwenhœkella* and *Pyrausta purpuralis*, from Grange, the last being very brightly coloured.—Mr. Prince, a bred series of *Cidaria reticulata*, from Windermere; *Nemeophila plantaginis* var. *hospita*, from the Lake District; and many coast species.—Wm. Mansbridge, *Hon. Sec.*

RECENT LITERATURE.

1. *Annals of Tropical Medicine and Parasitology.* Vol. vi. No. 1, B (May 29th, 1912); No. 2 (July 31st, 1912); No. 3, A (September 12th, 1912). Liverpool. In addition to papers concerning insects in their relation to disease, such as malaria and sleeping-sickness, there are:—(1) "A new Tsetse-fly from British East Africa (*Glossina austeni*) by Prof. R. Newstead, F.R.S., in No. 1; and (2) Three important papers in No. 2 by H. B. Fantham, D.Sc., and Annie Porter, D.Sc., on the "Isle of Wight Disease of Bees."

2. *Memorias do Instituto Oswaldo Cruz* (Ano 1911, Tomo iii. Faciculo ii). Rio de Janeiro, 1911.—Pages 295–300 are concerned with certain Culicidæ.

3. *Two Insect Pests of the United Provinces*—the Sugar-cane Grasshopper (*Hieroglyphus fuscifer*) and the Potato Moth (*Phthorimœa operculella*)—by T. Bainbrigge Fletcher, R.N. ('Agricultural Journal of India,' vol. vi. pt. ii). Calcutta, 1911.

4. *Dragonflies of the Cumberland Valley in Kentucky and Tennessee*, by C. B. Wilson (Proc. U. S. Nat. Mus. vol. 43, pp. 189–200). Washington, 1912.

5. *The Proportion of the Sexes in Forficula auricularia*, by H. H. Brindley, M.A. (Proc. Camb. Phil. Soc. vol. xvi. pt. 8). Cambridge, 1912. A short but important paper, which must have entailed a large amount of work in its preparation.

6. "*Microscopes for Entomologists.*"—We have received a copy of the new edition of E. Leitz' Catalogue of Microscopes, and a pamphlet concerning a new eyepiece for demonstration purposes. Some of the new forms of microscope are specially suitable for entomologists, and anyone intending to purchase an instrument would do well to call at 18, Bloomsbury Square, W.C., and inspect them.

W. J. Lucas.

The Humble-Bee, its Life-History, and how to Domesticate it. By F. W. L. Sladen, F.E.S. Illustrated with Photographs and Drawings by the Author, and Five Coloured Plates Photographed direct from Nature. Pp. i–xiii, 1–283. London: Macmillan & Co., Limited. 1912.

Probably few insects of the open country are more familiar to field entomologists than Humble-Bees, and yet, speaking generally, how limited is our knowledge of these very interesting members of the Hymenoptera-Aculeata! Except, of course, to those who specially study Bombi, the separation, for example, of the workers of *B. lucorum* from the workers of *B. terrestris* would not always be an easy task, even when the respective queens of these species could be distinguished with some certainty.

The beautiful and very lifelike figures, together with the descriptions, comparisons, &c., furnished by Mr. Sladen in the book under notice, should certainly remove most of, if not all, the difficulty connected with the satisfactory identification of our humble-bees and usurper-bus. Apart, however, from its utility as an aid to identification, the book is a veritable storehouse of information concerning life-history, habits, parasites, enemies, and many other matters of great interest to the student of Bombi.

The seventeen species of *Bombus* recognized by Mr. Sladen as British are here divided into two main groups: Pollen-storers (eight species), and Pocket-makers (nine species), the latter being again subdivided into Pollen-primers (four species), and Carder Bees (five species). Two species—*B. soroënsis* and *B. cullumanus*—have only been associated with the pollen-storers because they possess structural affinities with members of that group, the author so far having been unable to study their nests. Six species of the genus *Psithyrus* are described and also figured on the plates.

Transactions of the Carlisle Natural History Society. Vol. ii. Pp. 1–256. 1912.

Among other papers of interest to naturalists in this excellent publication are two which will chiefly appeal to entomologists. These are: "The Lepidoptera of Cumberland, Part ii. (Moths)," by George R. Routledge, F.E.S. (pp. 94–183), and "The Coleoptera of Cumberland, Part ii.," by Frank H. Day, F.E.S. (pp. 201–256). In the instalment of Mr. Routledge's list over two hundred and thirty species, belonging to the families Sphingidæ to Noctuidæ, are entered as found in the county. Mr. Day, dealing only with Haliplidæ, Dytiscidæ, Hydrophilidæ, and Staphylinidæ, records six hundred and seventy species for Cumberland.

Localities are given in each list, and in that of the Lepidoptera there are references to literature and remarks on variation, &c.

OBITUARY.

William Forsell Kirby, F.L.S., F.E.S.

For a second time this year the 'Entomologist' appears in mourning, for we have to deplore the loss of yet another of the willing workers who have so materially assisted us on the Reference Committee of our magazine, William Forsell Kirby. Mr. Kirby, indeed, in retirement as in active harness, proved himself to be one of the most accurate, original, and painstaking of naturalists. Nor was the field of his activities circumscribed within one particular Order; while, independently of entomological work, he made name and fame as linguist, and poet in the realms of folk-song, and fairyland. The sagas of the North and the tales of the Orient particularly exercised a fascination over a mind none the less imaginative because, tutored in the schools of science, it had achieved the virtue of orderliness. I regret to say that it was only in his later life that I came in close touch with him, and learned to appreciate his exquisite and fantastic humour, his literary sense, and profound scholarship. Away, indeed, from his Department in the Natural History Museum, South Kensington, where he did faithful service from 1879 and 1909, after twelve years' apprenticeship in the Museum of the Royal Dublin Society, he allowed himself to pass from the dusty road of reality to the by-paths of romance with all the enthusiasm and freshness of a heart which never grew old. He even broke a lance or two in the arena of controversial theology, his views as a naturalist in relation to the organization of the cosmos finding expression in a book on 'Evolution and Natural Theology.' But it is not within our province here to appraise his literary labours outside the sphere which he continued to enrich and adorn to the last days of a useful life; though I recall now that it is barely a year since he wrote to me in connection with a projected entomological text-book which he had been offered: "I have other work in hand, and can hardly spare the time; besides which, I have rather written myself out in that direction." This, however, was no more than a characteristic assertion of the innate modesty of the man whose pioneer endeavours opened up to so many otherwise "British" entomologists new and delightful regions to explore. His 'Manual of European Butterflies' appeared in 1862, and was, I believe, the first guide to the subject by an English author published in England, and this he supplemented in 1863 with 'A Synonymic List of European Butterflies for Labelling Cabinets,' which, again, was followed eight years later by the 'Synonymic Catalogue of Diurnal Lepidoptera' (Supplement, 1877) —still a standard and much consulted authority. Meanwhile, a number of papers from his pen on all Orders were being contributed to the 'Transactions' of the Entomological Society of London, and the Journals and Reports of other scientific Societies; and past issues of the 'Zoological Record' bear further testimony to his unflagging industry as a compiler. He was elected a member of the Entomological Society in 1861, and served as one of the Hon. Secretaries from 1881 to 1885, and as member of the Council in 1886. He joined the staff of the 'Entomologist' in 1894.

The son of Mr. Samuel Kirby, banker, of Leicester, he was born in 1844, and married, in 1866, Johanna Maria Kappel, who predeceased him in 1893, leaving one son. William Forsell Kirby himself died on Wednesday, November 20th last, and was buried in Chiswick Cemetery on November 26th.

(15)

H. Rowland-Brown.

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